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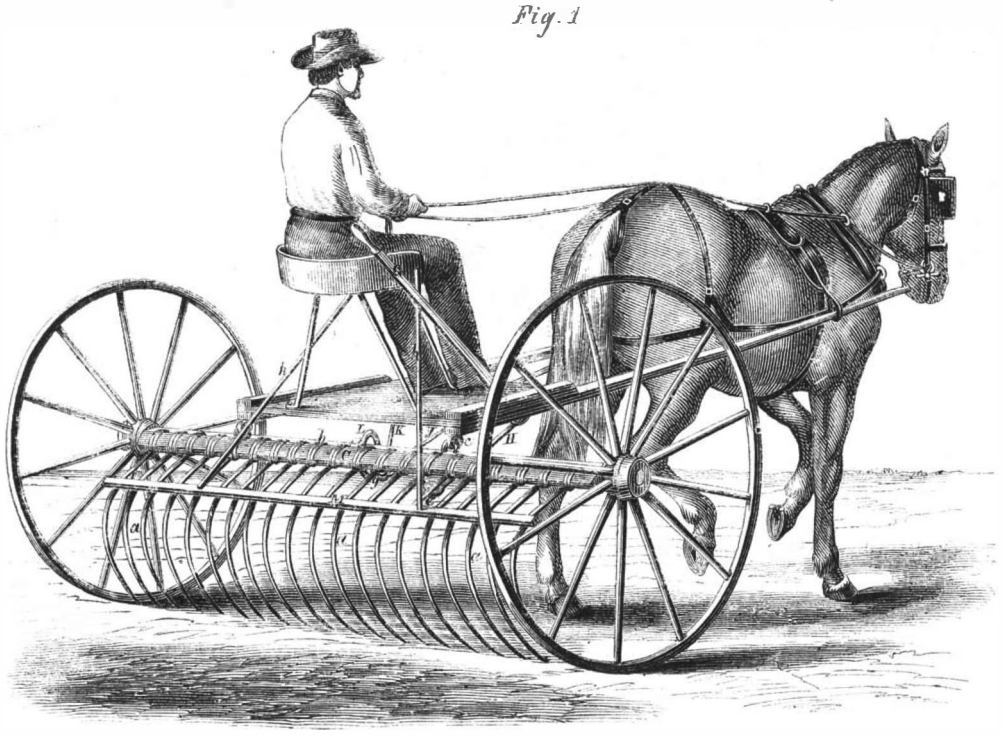
Improved Horse Rake.

The horse rake here illustrated is kept in position while in operation by the combined action of the driver's weight and the power of the horse when exerted to draw the machine. The construction will be understood from an examination of the drawings, of which Fig. 1 is a perspective view, and Fig. 2 is a vertical section. Similar letters refer to the same parts in both figures.

The axle, A, forms the rake head in which the wire teeth, *a*, are inserted; the teeth having a coil to increase their elasticity as usual, and the wheels, B, running loosely upon the ends of the axle. The driver's seat, E, is supported by an elastic rod, F, which is secured to the platform, D; this platform being bolted firmly upon the thills, C. The thills are attached at their back ends to the upper-back corner of the axle by hinges, *c*, and it will be seen that this position of the hinges causes the weight of the driver to prevent the axle from turning and releasing the teeth from their hold upon the load of hay which they may have gathered.

Fig. 1

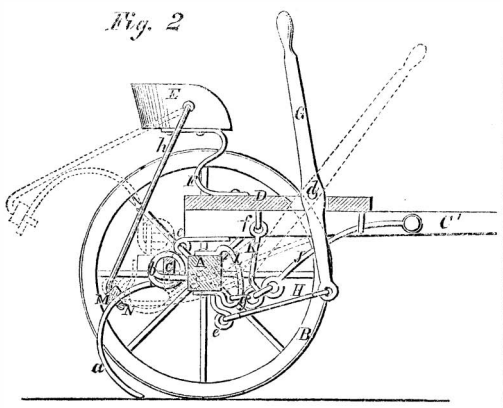


MELLINGER'S HORSE RAKE.

The turning of the axle is also prevented by the mode of attaching the horse to the machine. The whiffle tree, I, is connected with the axle by the rod, through the medium of the link, *g*, and long clevis, L; this clevis being secured firmly to the front side of the axle at its middle. As while the hay is being gathered the link, *g*, is at the lower end of the clevis, L, and below the level of the axle, the strain of the horse upon the rod, J, tends to prevent the axle from turning.

When the load of hay is gathered by the teeth and the driver wishes to deposit it in a windrow, he gives a turn to the axle by means of the lever, G. This lever is pivoted to the platform, D, at *d*, and is connected at its lower end by the long link, B, with the pendant, *e*, which is firmly inserted into the axle at its lower side and near its middle. This turning of the axle carries the parts into the positions represented in the dotted lines in Fig. 2; raising the teeth and depositing their burden of hay.

Fig. 2



To prevent any portion of the hay from being carried up by the teeth as they rise, a bar, M, is supported by rods, *h*, from the driver's seat, and this bar carries an iron loop through which all but the two outermost teeth pass. As this bar and loop retain their position, while the teeth rise up between them, they scrape the hay from the teeth and hold it down upon the ground.

As soon as the windrow is past, the driver draws back the lever to the position shown in full lines in Fig. 2; thus turning the axle and bringing the teeth again to the ground, ready to resume their operation of collecting the hay as the machine proceeds across the field.

This machine is easily operated, and it has no gears to become obstructed by catching the hay.

The patent for this invention was granted, through the Scientific American Patent Agency, May 13, 1862, and further information in relation to it may be obtained by addressing Mellinger Brothers, Mount Pleasant, Penn.

The Atlantic Cable Again.

The British Admiralty have granted to the Atlantic Telegraph Company the services of the ships and crews necessary for revising and extending the former surveys of the route along which the cable is intended to be submerged. The route westward from the Irish coast, for a distance of some five hundred miles, will be sounded at distances of about a mile apart, the previous soundings having been some thirty miles asunder. A good map of the bottom may, in this manner, be obtained, and thus facilitate the operation of laying the cable. Careful examination will also be made of the Newfoundland coast, and the English government have consented to send, free of cost, the ships necessary to attend as pilots, and assistants generally to the ships from which the cable will be paid out. Further negotiations are in progress, the result of which will, undoubtedly, lead to facilities for raising the additional capital necessary to complete this enterprise, the want of which has of late been so seriously experienced by both England and America.

A NEW IRON-CLAD TURRET SHIP.

The keel of a large new turret ship, on the *Monitor* principle, was laid on the 17th inst. in Jersey City. Its extreme length of armor will be 200 feet, extreme length on water line 190 feet, extreme breadth over armor 46 feet, breadth of molded beam 37 feet. The bulwark armor timbers are to be oak no less than 17 inches in thickness. The plating of the bulwark will be 5 inches in thickness, in layers of 1-inch plates planed at the edges and breaking joints. This armor will extend 3½ feet below the water line, and project 3 feet 8 inches beyond the hull proper. The deck beams are to be of oak 12 inches thick covered with pine planking 7 inches thick, and over these two courses of ½-inch plates will be fastened.

She will be provided with one revolving turret of 21 feet internal diameter and 9 feet high, and covered with eleven courses of 1-inch plates. The turret will rest on a flat ring of gun metal, and revolve on a central shaft 1 foot in diameter. This turret is to be armed with two 15-inch Dahlgren guns—such as those which have been described in our columns as now being manufactured at the Fort Pitt Works, Pittsburgh, Pa. The pilot house is to be round like the gun turret, and in this respect is an improvement over the square pilot house first built for the *Monitor*. The smoke pipe is to be shot-proof—another good improvement; it will be 8 feet in hight, 6 inches in thickness, telescopic in shape, and covered on the top with a grating to keep out shells. This vessel is to be propelled by a pair of horizontal engines, each having a cylinder 40 inches in diameter, with a stroke of 22 inches. Ventilating blowers will be used, and the cold air is to be drawn through the top of the turret. The propeller will be 12 feet in diameter with a pitch of 16 feet, and two of Martin's tubular boilers will be provided. She will be of prodigious strength and capable of resisting the most powerful guns yet made.

This large turret war ship is to be made entirely of American materials—no foreign iron must be used. Her cost is to be $400,000, and she is to be completed in five months, to do which between 400 and 500 men are to be employed upon her in day and night squads The contractors are Secor & Co, but the work is to be done by J. Colwell, of the Fulton Foundry, and the entire supervision of it will be under Mr. George Birbeck, Jr.

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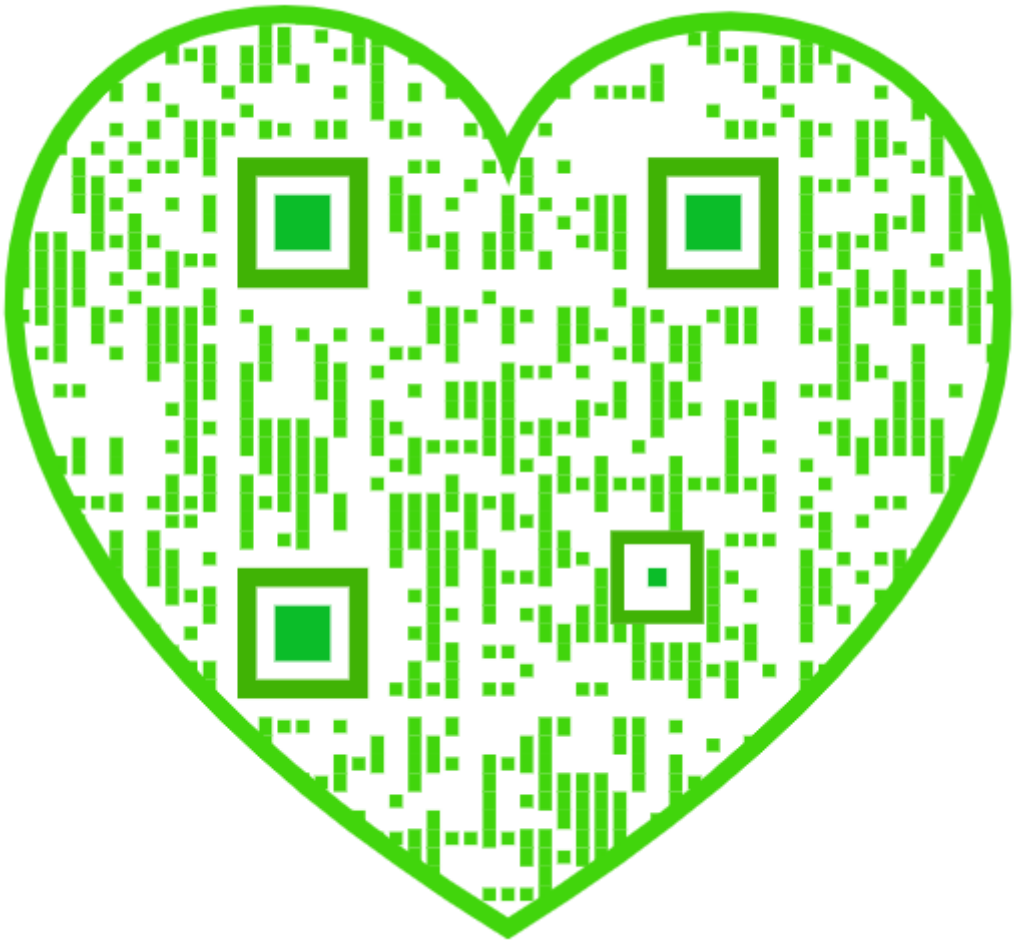


THE LONDON EXHIBITION.

On another page will be found a letter from our special correspondent, Mr. J. E. Holmes, about the London Exhibition. The following courteous and candid extracts are from the London *Mechanics' Magazine*. They corroborate the modest but conscientious views of our special correspondent on the utilitarian character of the articles in

THE AMERICAN DEPARTMENT.

The display of American products at the great Exhibition would, no doubt, have been greater but for the present unhappy conflict in that country. As it is, the American court is well worth a visit, and deserves a careful study. Scientific men will recognize in the varied and useful inventions which are there exhibited simplicity of construction and beauty of workmanship, and the unscientific will see much to admire in the appliances by which labor is made easy and toil pleasant. American "notions" are intensely utilitarian. Increased production at the smallest expense of labor is their maxim. Many of the machines here exhibited are adapted to field and farm labor, and it is no disparagement of our eminent agricultural engineers to say, that in regard to these implements the Americans have been able to hold their own, and maintain their position against all competitors.

On entering the court, which is at the southeast corner of the building, Wood's mowing and reaping machines occupy a prominent position. These are exhibited by Mr. Cranston, of King William street, and have attained a large sale in England as well as in America. During the last eight years 30,000 of them have been manufactured, 2,500 of which have been sold in England. It is at present set up as a reaper, but can be easily changed to a mower by removing the reel and platform. A self-acting rake can be adjusted to the reaper, which will deliver the cut grain in bundles at the side.

Here is also the mowing machine which gained the first prize at the Royal Agricultural Society's show at Leeds, last year. Apart from the ingenious construction of this machine, it really merits inspection for the beautiful style and finish of its workmanship. Notwithstanding the sneers of some finical and fastidious critics about this Exhibition being a huge puff and a vast advertising mart, we rather take it to be a school where all may learn much from each other. Our artizans and mechanics will get many a useful hint by comparing the workmanship of the various articles exhibited, and may emulate the excellence displayed by others without anything derogatory to themselves. These and other kindred machines are producing a wondrous change on the slow, rude forms of agricultural labor. The application of science to farming is making the land more productive.

Let the visitor walk straight across from these machines and inspect some hay and manure forks manufactured by Batcheller and Sons, and exhibited by Messrs. Smith, of Doncaster. These forks look more like elegant toys than implements for laborious work. They are made of the best American cast-steel, with two, three and four oval prongs, and are remarkable for lightness, strength and elasticity. They are about half the weight of an ordinary English fork, maintain their perfect shape till worn out, and enable the laborer to do his work with ease and rapidity. They are the most perfect agricultural instruments we ever saw.

In a case adjoining these are exhibited coopers' axes, chopping axes, and adzes, from the Douglas Axe Company, Massachusetts. These tools are of beautiful shape and finish; the steel is of the finest temper, and as specimens of American cutlery will, we think, be unsurpassed by anything of the kind in the Exhibition.

Drake's boring and spacing machine is exhibited by Mr. Wemple, of Albany, N. Y., and is a novel and very useful invention for boring blind stiles, or any other wood-work where a series of holes are required at equal distances apart, doing the work with great accuracy, and saving the labor of spacing and laying it out. The machine, though having the appearance of being complicated, is really very simple and effective, doing its work, which otherwise would be tedious, with great rapidity and precision.

On passing Ward's ocean marine telegraph we found him in the midst of a circle of inquiring visitors who were taking a lively interest in his invention.

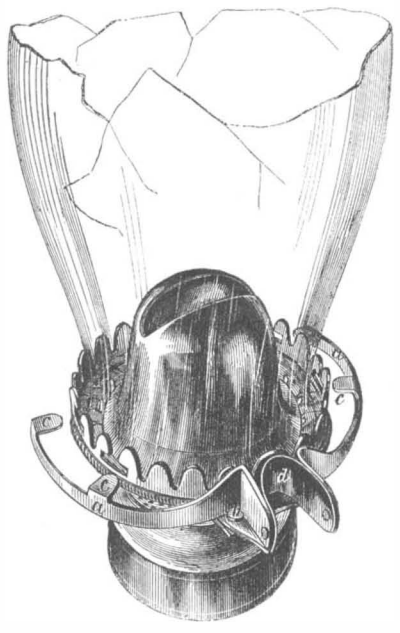
Mr. Beardsley, of Otsego county, N. Y., exhibits two machines of a very American-like appearance, which have attracted considerable attention in that country. The hay elevator is intended for unloading hay into the barn or on to the stack. The two arms move on a pivot, and are made to clutch the hay by tightening the chain. A trip hook is put into the ring of the chain, or to unload by horse power, a sheaved block is attached to the ridge and another on to the floor where the horses are hitched, and as they walk off on to the ground, up goes the fork with one-third of a wagon-load at once.

The earth elevator, by the same inventor, is on a similar principle. It is meant chiefly for drain cutting and ditching, and has the same object in view, rapid working and the saving of hard labor. For making embankments or draining on a large scale we think the machine merits attention.

We shall return again to this court, and would recommend those to visit it who are looking for the useful more than for the showy. There are some things here which will yet make themselves known in the old world as well as the new.

JACOBS'S MODE OF SECURING CHIMNEYS TO LAMPS.

The immense production of coal and rock oils has



so reduced the price as to lead to their extensive use in place of other substances for generating light, and as they are burned entirely in lamps, an enormous demand for these has sprung up; leading manufacturers and others to put forth great efforts to improve the article. Already many patents have been taken, and some of the inventions have proved exceedingly profitable. The most profitable of any that has come to our knowledge is a plan for holding the chimney in place by a spring, which not only facilitated the taking off and putting on of the chimney, but by the yielding of the spring prevented the chimney from being broken as it expands by the heat. One of the officers of a lamp manufacturing company told us that their company were paying the inventor $300 per month for the right to use this little improvement. The plan which we here illustrate holds the chimney by a spring, but by peculiar, novel and convenient arrangements, which enable the chimney to be removed or replaced with great facility. It will be readily understood by a glance at the engravings almost without a description.

Two fingers, *a a*, are secured to the lamp top by pivots, *b*, which enter ears formed for the purpose upon the lamp top. The fingers, *a a*, have projections, *c c*, formed upon their inner edges, to pass through slots in the lamp top and catch over the rim upon the lower edge of the chimney. The short arms of the fingers, *a a*, which extend outward from the pivots are flattened so as to be readily grasped by the thumb and finger, and they are pressed apart by a curved spring, *d*, which forces the fingers inward, carrying the projections, *c c*, through their slots and securing the chimney in its place. When it is desired to remove the chimney, the outer arms of the fingers, *a a*, are grasped by the thumb and finger of the operator and with the other hand the chimney is taken off. The chimney can thus be kept in a vertical position, preventing it from being soiled by the smoke or broken by the heat of the flame.

The patent for this invention was granted May 13, 1862, and further information in relation to it may be obtained by addressing the inventor, Thomas T. Jacobs, at Mount Carroll, Ill.

ADAMAS---SOAPSTONE.

We have had several inquiries recently in relation to the supposed new material which has received the name of Adamas, and respecting which we published some information, taken from the London *Artizan*, on page 340 of our present volume. This substance is simply soapstone under a new name. The *Artizan* states that it has lately come into very general use for gas burners. On page 124, Vol. XIII, Scientific American (old series), we gave a full description of the mode of making such gas burners. The *Artizan*, however, does describe a new application of it, namely, for journal boxes of machinery as a substitute for Babbitt metal. As very many of our present readers have not access to the former volume containing the description of the mode of treating soapstone and making it into gas burners and taps, we republish it because the information is very useful.

The soapstone is first cut into small slabs of such a size as will accord with the articles that are to be made of it. These small slabs are now put into iron boxes hermetically sealed, and placed in a low fire where they are heated very gently at first and then gradually raised to a red heat. They are now cooled very slowly by withdrawing the iron boxes from the fire and covering them with dry warm sand or ashes from the fire. (An annealing oven will answer the same purpose.) When perfectly cool these annealed soapstone slabs can easily be turned into the desired form in a lathe, after which they are boiled in oil until they acquire a deep brown color. When taken out of the oil and dried they take a beautiful polish by simply rubbing them with a woolen rag. The inventor of these gas burners is Mr. Schwartz, of Neuremberg, Germany. They were recommended by Prof. Liebig, and by the Scientific American, five years ago.

The London *Artizan* states that Mr. Leoni makes his gas burners, &c., of soapstone dust, molded into the desired form, then annealed. No description of the method of giving the dust cohesion has been published. Soapstone dust has been used to some extent for twenty years as an anti-friction agent in journal boxes, and soapstone rollers are used in the dressing frames of New England cotton factories.

A SAFE GUNPOWDER.

G. B. Wiesling, Esq., a civil engineer, at present residing at Van Nest Gap, in New Jersey, has invented a gunpowder of novel composition, which possesses some extraordinary and valuable properties. If ignited in an unconfined mass or in an open keg, it burns without an explosion, while if thoroughly secured by tamping, it explodes with as much force as ordinary gunpowder.

Mr. Wiesling has used this powder extensively in his large operations in the Van Nest Gap tunnel on the Warren Railroad—he being one of the contractors for this work, and having had the practical direction of it during the eight years in which it has been prosecuted.

A patent for the powder has been applied for through the Scientific American Patent Agency, and has been allowed by the Department, though the papers are not yet issued. By varying the proportions of the ingredients a powder is produced which is explosive under all circumstances, and this property may be varied to any extent desired. Besides its safety, the inventor says that this powder may be sold for half a dollar a keg less than ordinary blasting powder.

Knowledge is power, saith the familiar adage. Let him who would possess both knowledge and power become a constant, faithful reader of the Scientific American. This will infallibly enlighten the intellect, quicken the perceptions, and inspire a new interest in all that is good and useful. Remember, that a new volume commences next week, and do not fail to send in your name as a subscriber.

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Improved Pitch Square.

It is only by long experience, and by having the attention directed to the subject, that any person, either performing work or having the direction of it, is able to appreciate the large proportion of time consumed in planning, measuring, and laying out. Instruments, therefore, which indicate the exact position for a cut or a hole, are valuable, not only from securing a greater accuracy in the work, but also from the saving of time which results from their use.

The accompanying engravings represent a simple implement for carpenters' and joiners' use, intended to facilitate the cutting of rafters, the laying out of stairs and many other operations. It consists merely in the combination of a carpenters' square with a graduated straight edge.

Fig. 1 is a flat view of the implement and Fig. 2 a view edgewise. A is a carpenters' square made of metal in the ordinary form with the outer edges graduated in inches and sixteenths, and the inner edges in inches and twelfths. The straight edge or stock, B, is in two parts, one upon each side of the square as shown in Fig. 2. These two parts of the stock are drawn together —grasping the square— by means of the bolts, C C, which are provided with nuts, D, having milled heads; dowel pins, *e e*, keep the parts in position. The bolts, C, pass through long slots, *c c*, in the square and *f f*, in the stock, allowing the relative position of those two piece to be varied.

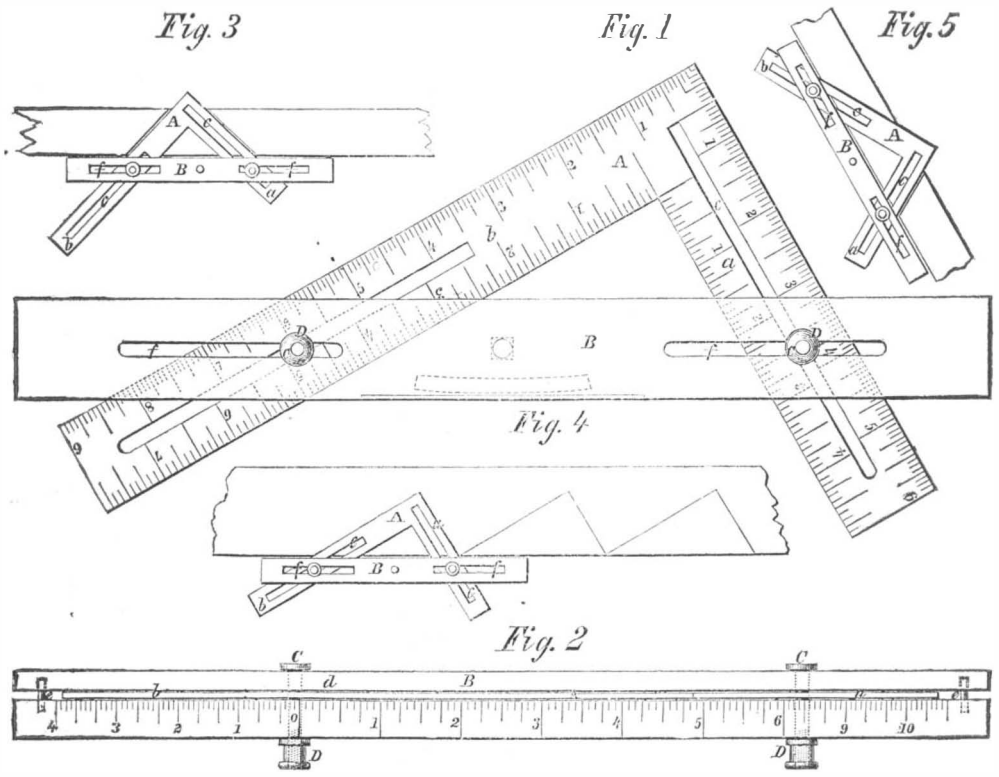
The outer edge of the stock is graduated in inches as shown in Fig. 2, the inches from 0 to 6 inclusive being subdivided into twelfths, and at each side of these points into sixteenths.

It would be impossible to give directions for the use of this implement in the great number of cases in which it may be employed, but a few of the more important will be sufficient to suggest the others as occasions arise. If it is desired to obtain the length of a rafter for a roof of which the span is 32 feet and the perpendicular hight 16 feet; let one-fourth of an inch on the scale represent a foot in the roof; set the short arm of the square with the fourth inch—equal to 16 quarters of an inch for the 16 feet perpendicular hight—even with the side of the stock; and bring the fourth division on the longer arm of the square—equal to 16 feet, one-half of the span—even with zero on the stock; then will the space on the stock between the two arms of the square represent the length of the rafter, and this space may be read off on the scale of the stock where this scale is cut by the short arm of the square.

When the implement is thus adjusted to determine the length of a rafter, the shorter arm, *a*, will give the bevel for the upper end, and the longer arm, *b*, of the foot, as shown in Fig. 5.

Fig. 3 illustrates the mode of adjusting the implement to be used as a miter, and Fig. 4 shows the manner in which it may be used for laying out stairs; one limb giving the angle for the treads and the other for the rises.

The patent for this invention was granted, through the Scientific American Patent Agency, May 6, 1862, and for the purchase of either the whole patent or territorial rights, or for any further information in relation to the matter, inquiries may be addressed to the inventor, John Iseman, at Rosston, Pa. [See advertisement in our next number.]



ISEMAN'S PITCH SQUARE.

LARGE numbers of steam engines upon the plan of G. H. Corliss, of Providence, R. I., are now made in Silesia, Prussia, and two of them are shown in the London Exhibition.

The Power of Sea Waves.

The following interesting extracts are from an article in the last number of the *North British Review* on the "Geological Changes in Scotland in Historic Times" :—

Of all the agents of change that have modified the surface of the land, none arrest the attention more than the waves of the sea. One cannot witness the effects of a storm on an exposed coast without being impressed with the enormous amount of wear and tear which is there visible.

No written records of changes effected by the sea in Scotland go further back than four hundred years. It would be interesting if we could trace the gradual retreat of the coast line for the past two thousand years. The force with which the waves of the German ocean fall on objects opposed to their fury has been measured with great care at the Bell Rock Lighthouse. This massive structure, rising 112 feet above the sea level, is literally buried in foam and spray during ground swells when there is no wind. Experiments were made from the middle of September 1844 to the end of March 1845 when the greatest pressure of the waves was found to be 3,013 lbs. on the square foot. When this lighthouse was building in 1807, a storm came on and six large blocks of granite, which had been landed on the reef, were thrown over the ledge to a distance of fifteen yards, and an anchor weighing nearly one tun was lifted out of the sea by the waves and thrown upon the rock. Stone measuring upward of 30 cubic feet and weighing two tuns are frequently lifted from deep water and thrown upon the Bell Rock during storms. The lighthouse keepers call these boulders "sea travelers." The sea at a distance of 100 yards around the Bell Rock reef is three fathoms deep. The breakers in the north sea beating around the Shetland Isles, sometimes tear up masses of rock in the island of Whalsey, weighing 8½ tuns, and these are frequently left heaped in a pile 62 feet high above tide-water mark. Rocks ranging in weight from 6 to 13½ tuns have been quarried by the waves in a storm from their positions in *situ* at levels from 70 to 74 feet above the common level of the sea. One block of 7 $\frac{7}{10}$ tuns weight situated at 20 feet above the sea level has been lifted from its bed and transported a distance of 73 feet, and in its progress it has been lifted over abrupt faces seven feet in hight.

On the west side of the Shetland islands, the violence of the Atlantic has produced scenes of devastation of which it is difficult to convey in words an adequate representation. We see the process going on still with a rapidity and magnitude which cannot but fill the observer with astonishment. In stormy winters huge blocks of stone are overturned and removed from their native beds to a distance almost incredible. In 1802 a tabular mass of rock 8 feet 2 inches, by 7 feet, and 5 feet in thickness, was removed to a distance of 90 feet by the sea in one of the islands. During the progress of erecting a lighthouse on Skerryvore rock—which lies on the west coast of Scotland, exposed to the full fury of the Atlantic, without a ridge of land between it and America—the pressure of the waves was measured in 1843 and 1844 and 1845 by Mr. A. Stevenson, the engineer. During a heavy gale in March, 1845, the pressure was 6,083 lbs. on the square foot. In winter the average pressure is 2,086 lbs. on the square foot, in summer it is only 611 lbs. Thus the greatest pressure is nearly three tuns on the foot—a force which is terrific in its destructive effects.

Polishing Metals.

A patent has been taken out by W. Clark, of London, for the following composition, which he calls brillantine—to be used as a polishing powder for metals: First, an extract of guano is obtained by boiling that substance in water until a concentrated crystalline mass is formed on cooling. Of this extract he takes 100 parts, by weight; 25 parts of calcined tripoli; 12 parts of wheaten flour, and common salt 10 parts; these are all mixed together in a vessel over a moderate fire until a homogeneous paste is formed, which is allowed to cool and harden. It is then reduced to fine powder, and is used for polishing metals and cleaning glass by mixing it with dilute alcohol or any alcohol spirits. It is said to form a very superior polishing powder. The crystallized urates obtained from the extract of guano possess great efficiency in acting upon hard metallic surfaces.

PETROLEUM FOR FUEL.

A few years since—Dec. 24, 1859, page 415, Vol. I. (new series) SCIENTIFIC AMERICAN—we suggested the employment of crude coal oil as a fuel for steamers. At that period we stated that crude coal oil could be obtained at ten cents per gallon, and that one hundred gallons of it were equal to one tun of coal for raising steam. The method we proposed for the burning of the oil was to convey it from elevated tanks in tubes, and allow it to pass through minute perforations in blocks of fire brick or soapstone, in the furnace under the boilers. The great subterranean repositories of petroleum in Western Pennsylvania and Canada, were not then discovered; and if the reasons we then advanced for the employment of such oil as fuel were sound, they are far more so now, on account of the unlimited quantities of earth oil that can now be obtained at very low prices. The following, from the Pittsburgh *Daily Chronicle*, shows that a beginning has been successfully made to employ liquid fuel in the manner we had suggested:

It is stated that the firm of Clark, Rust & Walker, proprietors of an oil refinery in Erie county, are now using naphtha, or benzine, as a substitute for coal in heating their furnaces. The naphtha is introduced into the furnaces by means of pipes, constantly feeding the fire by a gentle flow, and keeping it up to any heat that may be desired. It saves the labor of two men, and also the cost of about eighteen dollars' worth of coal per week, making an aggregate in reduced expenses of some thirty dollars. There being no demand for naphtha, it has accumulated on their hands, and they are, of course, gratified at the discovery of a means of disposing of it in the prosecution of their regular business.

THE business at Windsor Locks, Conn., which had been much depressed by the war, is beginning to revive and flourish. The paper makers and sewing silk manufacturers in this place are now doing a good business.

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NOTES ON MILITARY AND NAVAL AFFAIRS.

OUR FORCES APPROACHING CHARLESTON.

Just south of the entrance to Charleston harbor, is Stono inlet and creek. On the north bank of the creek lies James Island, a considerable parcel of the sacred soil. It is a low, marshy tract, forming part of the westerly bank of the Ashley river, between that and the Stono, and is the only territory between us and the city. The enemy have fortifications here and are bringing reinforcements from Savannah *via* the Charleston and Savannah railroad. The precise nature of their defences is coming slowly to light with each day's advance. The Federal gun boats have succeeded in shelling out some batteries which were erected for the defence of that point and have made their way up the creek toward the city. Recent intelligence from southern journals state that the Federal forces under Generals Hunter and Benham are now on the Island and have had a spirited engagement with the enemy. No victory being claimed by them we may properly conclude that our forces did not get worsted in the fight. A Georgia regiment was cut up severely and one colonel mortally wounded. The Federal forces there are estimated at 16,000 and appearances seemed to indicate that the enemy was very strong. We shall be very happy to chronicle the capture of this stronghold of secession. The war began there, and if judgment should earnestly begin at this point few would complain. We are anxious to hear the result of the engagement from reliable sources.

The women, children, and household property are being removed from Charleston, by its residents, in anticipation of its early bombardment.

GEN. M'CLELLAN AND HIS COMMAND.

The *Tribune* correspondent writing from the battle field of Fair Oaks, and with a full knowledge of the facts says, "it would have been economical, humane and politic to have given McClellan all the disposable troops north and west of the Ohio, when he commenced the invasion of Virginia," intimating that this policy would have enabled him to have reached Richmond weeks ago. If Napoleon left any legacy to the science of which he was a master, it was the concentration of forces, and the striking an enemy with overwhelming numbers, or with a rapidity of success in blows that stun while they surprise.

The intelligence which comes from Richmond, of McClellan's progress, leaves no apprehension of the result, for, as the veteran Spanish General Prim is reputed to have said, after a visit to the camp, "mortal man cannot do more than Gen. McCellan is doing at this moment, and success is certain if you only leave him alone." Gen. McClellan's military judgment, and comprehension of the situation, are confirmed by the military criticisms in Europe, which, supposing the disposition of the troops to be his, condemn him for cutting off his army on the Peninsula from McDowell's and Banks's divisions.

MISCELLANEOUS.

General Sumner's passage of the Chickahominy river, on the first day of the battle of Fair Oaks, was one of the most daring and successful operations of the war. The correspondent of the New York *World* says:—"If it astonished the enemy then to learn that he had crossed, it is equally surprising to us now to learn how he did it. His rearmost battery wagons had scarcely been hauled off the floating and perilous causeway of logs before the rushing waters swept the timbers away, making huge gaps in the work, and rendering that avenue of approach entirely useless."

Camp Douglas, Chicago, now embraces one hundred and fourteen acres. It contains 8,962 rebel prisoners. Five hundred and ten have died or have been discharged.

The rebels rate their own forces at Richmond at ninety-five thousand men and McClellan's at one hundred and twenty thousend. We presume they know all about McClellan's army as hundreds of spies are continually hovering about the camp.

Hotchkiss & Sons, of Sharon, Conn., are actively engaged in the manufacture of shot and shell for the government. They employ 300 persons, and make shells varying in weight from five to one hundred and fifty pounds for different guns.

The Bangor (Me.) *Whig* states that 100 men are employed in the granite quarries near that place on a government contract.

SECRETARY WELLES AND OUR IRON-CLAD NAVY.

The Secretary of the Navy has recently made an important communication to the naval committee of both houses of Congress in regard to the construction of iron-clad war vessels, in which he states that a radical change has commenced in the construction and armament of war ships, which dispenses with such navies as have hitherto existed, and Congress is solicited to decide whether the government will promptly take the initiatory steps to place our country in the front rank of naval powers. The Secretary says:—

It is now generally conceded that vessels for fighting purposes must be heavily plated with iron if they are not built entirely of that material. In this, as in most costly fabrics, economy is reached through durability.

Iron ship building is new in this country, but few persons are engaged in it, and it is a novelty in our navy yards. Heavy iron beams, shafting and thick iron plates can be procured from only two or three parties, and then in limited quantities, and subject to great delay. Individuals have little use for iron of such magnitude as the navy must have, and there must unavoidably be great outlay to prepare for the execution of such work. With only the navy for a purchaser, there can be no competition, and the government will be compelled, under such circumstances, to pay almost any price the mills and forges may demand.

No inconsiderable portions of an iron ship can be made and procured at the ordinary mills, and, so far as it can be done, it may be the best policy to be so supplied; but the heavy and expensive portions cannot be so procured; and, unless the government is prepared to execute the work, it will be subject to imposition, and its vessels to marked inferiority.

The Secretary suggests that a million or two of dollars judiciously expended at present to improve the machinery, &c., in some of the government yards, for fabricating the heavy iron work for vessels, "may save hundreds of dollars and the honor of the nation." A number of gunboats are now being constructed on our Western waters, and a government navy yard and foundry is recommended to be established on some favorable point in the Mississippi Valley. Secretary Welles trusts that Congress will not adjourn without making appropriations for providing such workshops in our navy yards as will enable us to construct a first-class navy, and he enforces this suggestion by saying:

No nation can have an advantage over us if we avail ourselves of our means and opportunities, and it is no longer doubtful that our future safety and welfare are dependent on our naval strength and efficiency. It is a duty, as well as a necessity, that we make these United States a great naval Power. We owe it to ourselves to commence at once this work, and the present Congress should, in my opinion, take the preliminary steps at the present session for laying the foundation for the construction of a navy commensurate with the wants and magnitude of the country. The place or places, the shops and tools, and other appurtenances for this great work, must be provided in season.

It is rather mortifying to our patriotism to be informed that unless the government provides suitable work shops to manufacture the most important portions of iron-clad vessels, it will be "subject to imposition," and "compelled, under such circumstances, to pay almost any price the mills and forges may demand."

A very general opinion prevails in the community that it costs the government more to build steamers in the national navy yards than to obtain them from private builders. And it is also believed by many persons who have given this subject attention, that any kind of iron work for war vessels, may be furnished by several manufacturers of angle iron, shafting and rolled plates, at less cost than such work can ever be made at any national navy yard. But whatever decision Congress may come to on the subject, it is imperative that we should have an effective iron-clad navy at the earliest possible date.

Large profits on a small capital. This is what we are all striving to make. We cannot possibly suggest to our friends a surer or better way of realizing the above results than to invest the sum of 4 cents weekly in purchasing the Scientific American. For this trifling amount you can have our paper sent regularly to your own address or to that of any friend or neighbor. We believe that such an investment would be productive of greater profits, in money and mind, than a hundred times the sum spent in any other way. Our new volume commences next week.

A manufacturer in Buffalo, N. Y., is filling a large order for petroleum oil for Mexico. The shipment goes to Acapulco, and a heavy business is anticipated all along the Mexican coast.

MEERSCHAUM.

This famous substance of which many tobacco smoking pipes are made is a hydrated silicate of magnesia. When pure it is white, but when it contains silicate of iron it is yellow. Good meerschaum can be indented with the thumb-nail, and is easily cut with a knife. It is found of different degrees of density—some kinds will float on water while others will sink. Those of medium density are preferred by pipe makers. Most of the genuine meerschaum obtained comes from Asia, but it is also found in Greece, Spain and Moravia. It is exported in the form of irregular blocks. In some cases meerschaum is fashioned into rough pipe bowls where it is dug, but it is mostly sent to Europe. The cities of Pesth and Vienna were formerly celebrated for their meerschaum manufactories. In forming a pipe-bowl the material is prepared for the operation by soaking it in a composition of beeswax and olive oil. The wax and oil absorbed by the meerschaum are the cause of the color produced in such pipes by smoking. The heat of the burning tobacco causes the oil of the tobacco to mix with the wax and olive oil in the meerschaum, and these gradually assume those dark tints so much prized by some inveterate smokers. In some cases the bowls of these pipes are stained artificially by soaking them in a solution of iron mixed with dragon's blood. The white meerschaums, however, should always be preferred.

The scrapings of the blocks of which the solid pipes are made, are triturated and reduced to powder, then boiled in soft water until a thick paste is formed, which is molded into blocks, that are dried, then cut out into pipes as from natural blocks. There are very many pipes sold under the name of meerschaum which are spurious compositions, but it is very difficult to detect the false from the true by mere inspection. Some fancy meerschaum pipes are very costly. These are mostly to be found in Austria. They are furnished with amber mouth pieces and studded with silver.

THE PATENT LAW AMENDMENT.

We regret not to have received the new Patent Bill in time to give it an intelligible review in this number. We have our suspicions that the amendments are designed in some degree to cripple the rights of applicants in their appeal privileges. We hope we are mistaken in this supposition, and that we shall get the bill in time to discuss it in our next number and before its passage through the Senate. A correspondent writing from Washington intimates that the amendment is the result of hasty and ill-advised legislation.

Wheat and Corn Export.

In the memorial of the Hon. S. B. Ruggles to President Lincoln, regarding the enlargement of the Erie Canal, he states that in 1861 no less than 6,712,233 barrels of wheat and flour, and 6,796,390 barrels of corn were carried on the Erie canal, all of which had come from the Great West. The total product of the wheat and corn of New York growth, carried on the canal in the same year, was only 955,532 barrels The annual wheat crop of New York is stated to be now only 8,681,000 bushels, that of New England only 1,077,000. The former amounts to only one-third of that required by the State; the latter is only sufficient for three weeks' consumption in New England.

To Preserve Strawberries.—To two pounds of fine large strawberries, add two pounds of powdered sugar, and put them in a preserving kettle, over a slow fire, till the sugar is melted; then boil them precisely twenty minutes, as fast as possible; have ready a number of small jars, and put the fruit in boiling hot. Cork and seal the jars immediately, and keep them through the summer in a cold, dry cellar. The jars must be heated before the hot fruit is poured in, otherwise they will break.

Niepce de St. Victor is now in Paris devoting his energies in making experiments for the purpose of solving the great problem of taking photographic pictures in their natural colors.

The *American Agriculturist* states that the month of June is the best time to prune. A sharp knife should always be used, so as to make a clean cut.

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Correspondence

EDITORIAL CORRESPONDENCE.

The Alleghany Bituminous Coal Field—Steubenville Mine—Coking Ovens.

STEUBENVILLE, May 30, 1862.

The distance from Wheeling, Pa., to Pittsburgh, Pa., is ninety five miles by the railroad which on the Ohio shore follows the windings of the river. The morning was fair, the sky was clear and the odors of flowers and tree-blossoms filled the breeze as I was wheeled along by the iron horse. The scenery was delightful, the ride exhilarating. This section of the country appears to have been a table land out of which the Ohio river has scooped its channel, leaving a series of rolling hills ranging from about five to six hundred feet on each side. The elevations resemble large mounds, separated by ravines. The soil is fertile, the hills are covered with verdure and cultivated to the summits. Planters mansions nestle among the trees on the hill sides, and cheerful villages stud both the Ohio and Virginia shores. The scenery is not grand, because no lofty mountains are seen towering in the distance, still it is certainly picturesque. The Virginia side of the river here is the celebrated "Pan Handle" track, and in spite of its uneuphoneous name is a lovely region. The hills contain plenty of coal as this is a portion of the Alleghany Great Bituminous Coal Field. The top seam of this field is exposed along the Monangahela, Alleghany and Ohio rivers, and has been called the "Pittsburgh seam" because it comes out so near the top of the hills in the vicinity of this city. The superficial extent of this seam is about 14,000 square miles. In some places it is found about fourteen feet in thickness, at Pittsburgh, it is about six feet, then it diminishes gently to the west and northwest to five feet. It has a dip due south of about twenty feet to the mile. In proceeding up the valley, the mines may be observed in various places cut into the face of the hills, and by drawing a line through these from Wheeling up to Pittsburgh, an incline of several hundred feet will be described. The mines near the top of the hills contain little or no fire damp, the coal is more free from sulphur, is softer, and can be coked in open pits. About four feet of the top of a six-foot seam scarcely contains any sulphur and it is excellent for iron smelting. But we have arrived at Steubenville, about twenty six miles from Wheeling, and here we stop to examine the most peculiar coal mine in this section of the country. The place is pleasantly situated on the right bank of the river, and like many of the villages and cities on the Ohio, it resembles an English town. Most of the houses are of brick and are covered with a faithful coating of soot. The coal mine is located near its west end on the hill and belongs to L. Borland & Co. Instead of working in the common top seam of coal by driving a horizontal tunnel into the face of the hill, they have sunk a vertical shaft—a pit—240 feet deep, exactly like an English mine. In sinking this shaft, two other smaller seams of coal were passed, until the present one which is worked, was reached. It is about 4 feet thick, but its great virtue consists in being free from sulphur, and its coal, thus possesses qualities, which when coked, render it about equal to anthracite for iron smelting. It is shiny and somewhat harder than the top seam of this field, which lies about 600 feet above it. The shaft of this mine is 16 feet long by 8 feet wide, and is divided in the middle by a partition. A strong frame extends above the mouth of the pit, or rather it may be called two mouths. A wire rope passes from the windlass of the engine over sheaves on the top of the pit frame, and is attached to two hoisting platforms, one of which descends one division of the pit with an empty coal carriage, while the other is ascending the other division with a loaded one. Like two large dumb waiters, the hoisting platforms are guided in grooves in the pit framing, and the system of operating is simple, convenient and very safe. When a loaded carriage is raised to the top a few feet above the pit mouth, it is run off and tipped upon an inclined screen which separates the small from the larger pieces of coal. At present only about one hundred tuns per day are mined. About three tuns per day are mined by each collier, who receives fifty cents per tun for the larger coal and fifteen cents for the fine coal. The mine is operated exactly like those in England; the working rooms are about thirty square feet in size and pillars of coal are left to support the roof, which is smooth sandstone—an excellent roof for the miners. Salt water filtrates through this seam of coal, and a saline efflorescence covers the ground around the engine house.

The mine is ventilated by a fire in an up-take side shaft. The fresh air passes down the working shaft, thence through the miners' room, and passages, and up the draft shaft to support the fire maintained in iron creel near the shaft top. A wagon lifts half a tun from the mine; the hoisting and lowering are performed by a horizontal steam engine and a reversible hoisting windlass. The engine is not stopped and reversed, as by the old-fashioned English giging method. The large coal sells in Steubenville for one dollar per tun, the small for 60 cents. The slack made at this mine is roasted in ovens, and converted into coke to be used for iron smelting. Twelve coking ovens, resembling large old fashioned brick ovens for baking bread, are employed by this company. It is roasted for about three days. This treatment expands 100 bushels to 125, but each bushel weighs 70 lbs. when it goes in, and only 38 lbs. when it is taken out of the oven. The coke made from this lower seam of coal is clean, hard and of a superior quality. The coals, shales and sand stones obtained in this mine contain well defined fossils. You can even trace the forms of antediluvian ferns in the coke as it comes from the ovens. When burning the printed leaf of a book, sometimes the letters appear more clearly defined, so in like manner the coking of this coal makes the more delicate organisms of which it is formed stand out more sharply. Near the rolling mill in Steubenville, a shaft has just been sunk, and this vein of coal reached, in order to use it for iron smelting. A shaft had been previously attempted within the precints of this mill, but in sinking it, a bed of quicksand stopped the operations. In several instances we have known of quicksand closely adjacent to river bottoms, stop the operations of shaft sinking. We do not know how extensive the lower seams of this field are, but in all likelihood they cover as great an area as the upper seam, for they have been found at Pittsburgh sixty miles distant. Its superior qualities, however, were unknown until recently. This region is rich in useful minerals. Limestone and grindstone grit are found above the upper coal seam, and potters' clay, fire clay and petroleum and salt springs are found all along the Ohio valley.

This great coal field, extends into and over the eastern side of the Appalachian chain of mountains. Its greatest breath is 100 miles, its longest diameter 225 miles. None of this coal comes to our eastern cities excepting moderate quantities of the Cumberland variety, through Maryland. It is the only coal however, which is used in Western Pennsylvania, Western Virginia, in many sections of Ohio, Kentucky and Indiana. Not only does the United States possess a far greater coal area than all the known world beside, but her coal seams are more easily worked than those of any other country. Our people cannot sufficiently prize the blessings conferred upon them in our vast and easily worked coal seams. No correct statistics have been kept of the quantity of bituminous coal that is mined annually, but it cannot be less than about 3,000,000 tuns, for half a million tuns are consumed yearly in Pittsburgh alone.

OUR LONDON CORRESPONDENCE.

American Inventions—Minerals and Oils.

LONDON, May 23, 1862.

MESSRS. EDITORS:—The Great Exhibition is now fairly open, and one can begin to study it as the living center of the world of industry, art and science. Nearly a month has passed since, at its opening, it was called "the most honored offspring of civilization." Since then all has been bustle and confusion, and the sounds of the hammer and the saw have been mingling daily with those of discordant organs, pianos and hundreds of other instruments. New wonders and beauties, however, have been gradually unfolded, and now the visitor may study almost every device under the sun, required for the use of man, while the most cultivated imagination may here revel in the displays of exquisite works of art. In this great depository of industry and art, lessons of the past are full of suggestions for the future. There is but little now in use in the mechanical and chemical arts which has not been invented within a life time. The lathes, engines, looms and agricultural implements in use thirty years ago, have mostly become relics of a past age. Perhaps the visitor to a like exhibition fifty years hence (1912) will judge our productions as we estimate those of the past century. That which we call the perfection of engineering and mechanical skill now may be estimated as crude efforts by the next generation. Such has been the case during the past—such will be the case in the future.

In looking (with a partial eye, I must admit), over this vast assemblage of man's productions, collected from almost every nation on the face of the globe, I am proud of our Yankee land. Though our direct contributions are as but one in two thousand, the impress of American ingenuity for saving labor is visible in all our machines, tools and implements. And I am vain enough to predict that, in the aggregate, the various nations represented here will be more benefited through the contributions of our 150 exhibitors, than by any 1,500 contributions in the whole list of 30,000 now entered. This may appear to be a boastful claim, but I do not think it is extravagant. I have waited for weeks that I might write advisedly, and in subsequent letters I will relate more fully what has been done by those of our contributors who have ventured here under very discouraging circumstances.

I will close by mentioning a few of our articles. Dr. Feuchtwanger, of No. 42 Cedar street, New York, has sent a splendid cabinet of minerals, consisting of more than 1,000 specimens, collected with great care from different States of our Republic. They attract much attention. T. D. Meads, of Michigan, has a choice collection of about 200 minerals, from the Lake Superior region. These are very beautiful. I have also a small cabinet collection from the mines of Col. Fremont, and another from Mr. Mosheimer, of the Washoe silver mines, California. The New Jersey Zinc Company exhibits some interesting specimens of the products of their mines and manufactures. In class No. 2, M. H. Bayley, of 61 Canal street, New York, exhibits samples of his crystal carbon oil, and F. S. Pease, of Buffalo, N. Y., has sent samples of his refined petroleum. These samples, I am sorry to say, have been ruled out of the building by the Royal Commissioners, from the wrong notion that they are explosive. I know them to be perfectly safe from explosion under all ordinary circumstances. A. Hale and Mr. Hotchkiss, of Lyons, N. Y., have sent samples of essential oils, and the Philadelphia College of Pharmacy has sent an interesting collection of American roots, herbs, &c. Yours, J. E. HOLMES.

Time is Money---Recollect That.

Anything which will give you a hint as to doing your work or accomplishing your ends in quicker time or with less labor, is equivalent to hard cash. We venture to say that there is not an honest trade or occupation known among the sons of men, in which its followers would not be benefited and enabled to save much time by faithfully studying the SCIENTIFIC AMERICAN. Farmers, mechanics, manufacturers, men of science and genius, see to it that the SCIENTIFIC AMERICAN is ever upon your table. Let it be your intellectual whetstone. Next week we commence a new volume. Be sure and send in your names as subscribers.

J. W. FAWKES is now in Illinois with his steam plow offering to plow the fields of the farmers by contract. The *Prairie Farmer* calls upon the farmers to give him encouragement, so that the relative economy of plowing by steam and animals may now lie fairly tested on the prairies.

FROM twenty counties in Illinois and Iowa alarming accounts have been received by the ravages of the wheat midge. From Kansas, Wisconsin and Minnesota, on the other hand, the reports of the wheat crops are most flattering.

THE address of F. B. Pierce, given in the list of patent claims in our issue of June 14, should have been Brockport, New York, instead of Brockport, Ill.

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An Improved Pump.

The accompanying engravings illustrate the construction of a new pump, the invention of James Budd, of Sandy Hill, N. Y., which will draw water from either of two fountains or wells, or from both, and will discharge from either of two nozzles or from both, at the will of the operater; the adjustments to determine its action in any of these repects being very quickly and easily made.

Fig. 1 is a perspective view, and Figs. 2 and 3 are vertical sections at right angles with each other. In Fig. 2, only one induction pipe, F, is shown, and we will first describe the operation when drawing water through this pipe. A is the cylinder, and B the piston. The piston is of peculiar construction, being formed of two cup-shaped ends, *a a'*, connected by curved arms, *c c*, to a hollow cylinder, *d*, and each containing a ball-valve, E, fitted to close an opening, *b*.

It will be seen that as the piston rod is drawn outward from the cylinder in the direction indicated by arrow 1, the valve in the cup, *a*, is closed, while that in valve, a', is opened, forcing the water upward through the chambers, *h* and *e*, into the air chamber, I, while the return of the piston in the direction indicated by arrow 2 carries a current of water upward through chambers, *h'* and *e'*, also into the air chamber, I. Thus a constant flow of water into chamber I is maintained; the retaining valves, J and *g g*, preventing a reflux current downward.

Fig. 1

BUDD'S TWO-STREAM PUMP.

From the chamber, I, the water passes by the pipe, K, into the chamber, L, whence it may flow through either or both of the vessels, M and M'; its course being determined by the position of the ball valve, N. This valve has two seats, *j* and *j'*, and when it is situated midway between them, as represented in the engraving, the passages to both nozzles are open, and the water is consequently discharged through them both; but if the valve is lowered upon the seat, *j'*, the passages to the nozzle, M, is closed, and the water can flow through the nozzle, M', only; while by raising the valve to the seat, *j'*, the passage to the nozzle, M', is closed, and the water is discharged through the nozzle, M, only. The stem, O, of the valve, N, passes through a stuffing box, P, and has a head upon its upper end by which the position of the valve may readily be changed at will. This is the explanation of the manner in which water may be drawn into the pump by one pipe, and discharged through either or both of two nozzles. The mode in which it may be drawn from one or both of two fountains, is shown in Fig. 3.

The induction pipe, F, is curved forward and connected with a chamber, G, which has a retaining valve, G, fitted to close the passage to one of the two fountains. From the upper part of the chamber, G', is a passage leading to the pipe, Q, which enters the second of the two fountains. This passage has a valve seat, *k*, to which is fitted a valve, S, and it will be seen that when this valve is drawn upward to its seat, no water can pass into the pump through the pipe, Q, and it must consequently be drawn from that reservoir alone with which the lower pipe communicates. But if the valve, S, is carried downward till it rests upon the valve, G, so as to keep the latter valve closed, then must all of the water to supply the pump come through the pipe, Q.

The valve, S, has a stem, J, passing through a stuffing box, U, and provided with a nut, V, for raising and lowering the valve. The engraving represents pendant arms, *l*, working in a spiral groove, *m*, in the cup, W, for working the valve, but any other plan may be adopted if preferred.

This pump is designed especially for fire engines, but the inventor claims for it superiority as a farm pump or for manufactories.

The patent for this invention was granted through the Scientific American Patent Agency, April 29, 1862, and further information in relation to it may be obtained by addressing the inventor, at Sandy Hill, N. Y.

Fig. 2

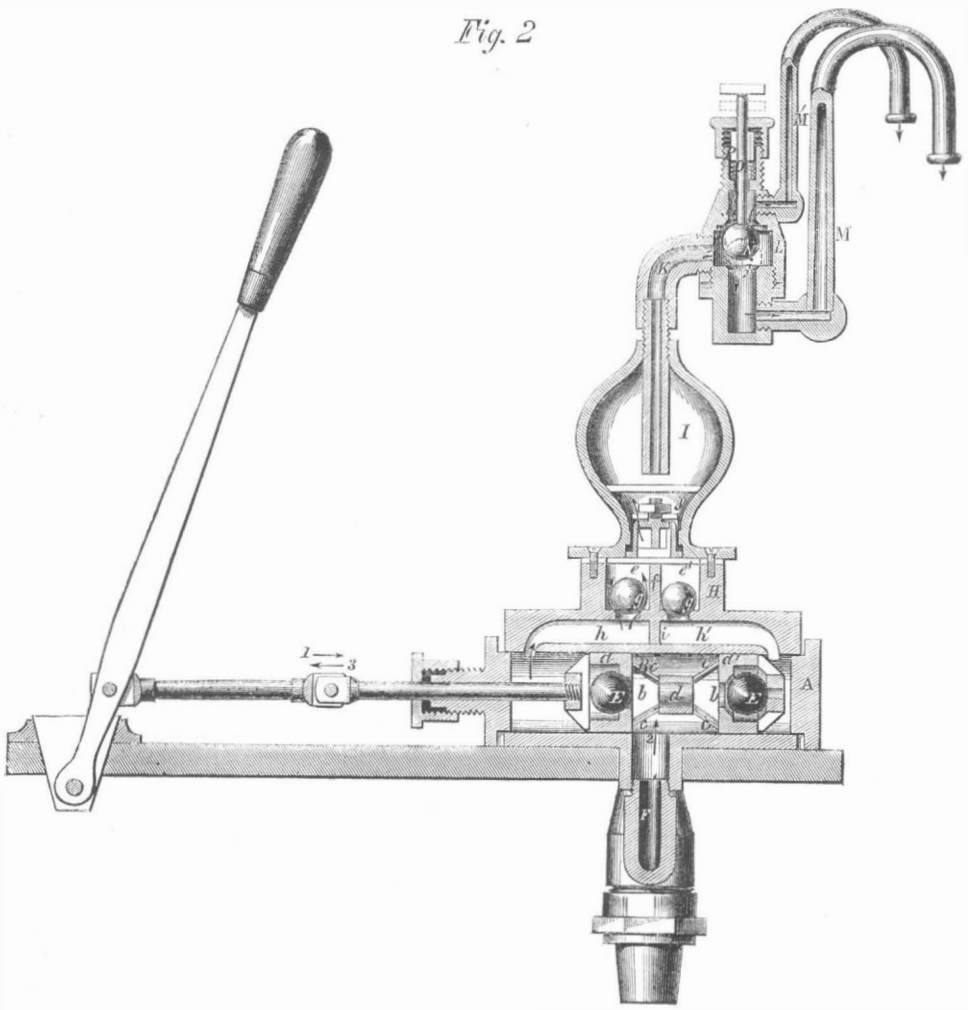
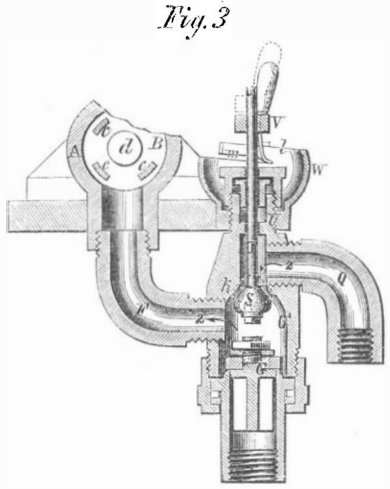


Fig. 3



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VOL. VI. NO. 26.....[NEW SERIES.].....*Eighteenth Year.*

NEW YORK, SATURDAY, JUNE 28, 1862.

SIX GOOD REASONS WHY EVERY MANUFACTURER, MECHANIC, INVENTOR AND ARTIZAN SHOULD BECOME A PATRON OF THE "SCIENTIFIC AMERICAN."

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THE END OF OUR VOLUME.

This number will conclude the sixth volume, new series, of the SCIENTIFIC AMERICAN. The progress which has been made in most of the departments of science and art during the past half year has not been surpassed in any equal period of time within our recollection. Our columns offer abundant evidence of the reliability of this statement. No less than 120 new inventions have been illustrated in this volume of the SCIENTIFIC AMERICAN; and 217 cuts, containing 350 figures, have been employed in illustrating these and several other useful subjects. Among these are the Agassiz Lectures, Steam Surface Condensers, Submarine Torpedoes, &c. Thus, our present volume, is replete with evidences of inventive activity and improvement.

The past six months have been happily more prosperous for our mechanics and manufacturers than we could have anticipated, considering the momentous struggle in which our country is engaged. As the term of a large number of our subscribers expires this week, we anticipate and solicit a renewal of their subscriptions, and also hope for a large increase of new subscribers. The SCIENTIFIC AMERICAN is the only weekly periodical on our continent devoted to practical mechanics, inventions and manufactures as a speciality. It is really necessary at this day that all those whose tastes and interests are devoted to science and inventions, should read its pages regularly or they will fall behind the age in a knowledge of those numerous improvements which are now ushered in so rapidly. No less than 1,529 patents have been issued from the United States Patent Office since the seventh of last January, and their claims are all published in the SCIENTIFIC AMERICAN. It is therefore reasonable to conclude, that unless our columns are carefully and regularly consulted by mechanics, manufacturers and inventors, they cannot keep posted up in the improvements of this progressive age.

PATENT LAW AMENDMENTS.

The new patent law which went into force on March 2, 1861, although admirable in many respects, was, in others, somewhat crude; and we are therefore glad to see that efforts are being made to remedy the imperfections.

A bill for this purpose has lately been passed in the House of Representatives.

We will briefly state the nature of some of the defects in the present law, coupled with the proposed changes, as gathered from a meager telegraphic report of the bill, received just as we go to press:

1. The new law created within the Patent Office a sort of independent tribunal, called the "Examiners-in-Chief," for the review and amendment of the decisions of the primary examiners. The Commissioner of Patents, although rightfully and legally the head of the department, has no control over the decisions of the Examiners-in-Chief, and he cannot hear any appeal in person, unless a fee of $20 is first paid to him; nor can an appeal be taken from the Patent Office to the District Court without first going through with the expense, formality, delays, and "red-tapeism" of two prior appeals, to the Examiners-in-Chief and also to the Commissioner.

The proposed amendment gives to applicants the right to take an appeal from the Patent Office to the District Court as soon as the case has been rejected a second time by the primary examiner. The formalities and expenses of the two intermediate appeals are thus saved. This is certainly a change for the better. We also infer, from the nature of the bill, as telegraphed, that appeals from the decisions of the primary examiners are to be taken to the Commissioner in person without any expense to the applicant, and that the Examiners-in-Chief will act as an advisory board to assist the Commissioner in deciding those appeals. We think that this will also prove to be a good change. As the law stands, there is a liability to conflict in the decisions of the various branches of the Office, when there ought to be the most entire unanimity.

2. Under the existing law, an applicant may wait two years after it has been decided to grant his patent, before paying the last installment of the fees, and the Letters Patent will date from the time of such last payment. But under the new bill, although the applicant will be allowed to wait two years if he wishes, still his patent must be dated back to a period not less than six months subsequent to the time when it was decided or passed for issue. This is also a good improvement.

3. The law now requires that when an application is rejected, the applicant shall go through the absurd form of swearing a second time that "verily he believes himself to be the original and first inventor," &c. There is no possible need of this formality; and it is a source of much delay and annoyance to applicants, especially to those who live at a distance. We are frequently compelled to send and procure these worthless pieces of paper, ycleped *renewed oaths*, from clients who reside in California, Europe and other quarters of the world. Our readers will readily see that much time is thus lost. We are glad that it is proposed to do away with this vexatious requirement.

ARM THE MISSISSIPPI FORTS.

We trust that Secretary Stanton will not, in the multiplicity of his duties, overlook the vital importance of promptly furnishing Forts Jackson and St. Philip with heavy cannon. This matter has been urged for several years by the officers of the Ordnance Department, but has been neglected by the cabinet and by Congress. It is most fortunate for the nation that it was neglected, as it was owing to this neglect that Commodore Farragut was enabled to pass the forts and capture New Orleans. But it would be monstrous folly to allow this neglect to continue any longer.

The control of the Mississippi river is the great object for which the rebels are contending, but as long as the two forts below New Orleans are in our possession, we have the command of this great highway; that is, provided the cannon in the forts are able to prevent the passage of vessels. But Commodore Farragut has demonstrated the practicability of sailing up the river between these forts, without exposing vessels to any considerable danger from the guns which they now contain.

It is plain, from recent articles in the London *Times*, that the aristocratic party in England are still hoping for an opportunity to intervene in our affairs, and it is impossible to anticipate what freak of policy the Emperor Napoleon may adopt when he hears of his defeat in Mexico, and there is certainly danger that a fleet of French or English iron-clad ships may, at any time, attempt to pass up the Mississippi and wrest New Orleans from our possession. If we allow the forts to remain in their present feeble condition we hold out the strongest invitation to such an enterprise, while the most powerful argument that we could offer against the undertaking would be a knowledge of the fact that it was impracticable.

It seems to us that whatever else has to be postponed, not one day's delay should be permitted in the task of strengthening, to the very utmost extent, and arming with the heaviest cannon, Forts Jackson and St. Phillip. The whole fleet and army, too, should be searched for a garrison of artillerists for these forts that are proof, by acclimation, against the attacks of yellow fever.

WHAT WE OUGHT TO DO IN RELATION TO IRON-PLATED SHIPS.

It is a curious fact that the long-continued and costly experiments in England, to test the question of the invulnerability of iron ships have taught us exactly nothing. These experiments have all been made with small cannon, and consequently furnish no demonstration of the effects of heavy ordnance.

Now, let our government, in the first place, ascertain the maximum charge which our 15-inch guns will safely bear, and then try the effects of both shot and shells thrown by these charges upon iron plates.

Having ascertained the thickness of iron required to resist hollow shells, and that required to resist solid shot, our inventors will be furnished with the proper data for their guidance in designing vessels to carry either class of armor.

It may be that no sea-going vessel can ever be constructed to carry plates which cannot be penetrated by solid shot, but if ships impenetrable by shells can be built, they will be safe against the most destructive element of naval warfare. Mr. Reid, of England, has designed a vessel which he regards as a good seaboat, and believes to be absolutely invulnerable to the attacks of artillery. But it may be that, though his plates can not be penetrated by cannon shot, the side of his vessel will be crushed in by the impact of a 500-pound ball driven forward by the explosion of 100 pounds of powder. What the effect of such a missile would be we have no means of knowing, and the first step is to ascertain this fact.

THE greatest horse show ever known, according to promise, is to be held at Chicago on the 2nd of September next. Fifteen thousand dollars are offered in premiums.

THE Amaskeog (N. H.) Company have contracted with the government to furnish 10,000 rifled muskets of the Springfield pattern.

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A GREAT SILVER WARE MANUFACTORY.

The Way Silver Spoons are Made—One Thousand Dollars a Day Changed from Coin into Plate—The Most Complete Silver-Ware Manufactory in the World—Two Tuns of Silver in process of Manufacture.

During a recent visit to Providence, R. I., we made a visit to Gorham & Co.'s manufactory of silver ware, and were politely shown over the etablishment under the guidance of the designer, a remarkably intelligent Englishman. This man says that he is acquainted with the large silver-ware establishments in London, and that this of Gorham & Co., is the most complete of any in the world.

This firm make only solid silver, using the silver coin as they find it, neither refining nor adding alloys. It contains a very small proportion of copper.

The first step in the process is to melt the coin. This is done in plumbago crucibles set in furnaces of anthracite coal. No reverberatory arrangement is employed; the heat passing through the walls of the crucible. The metal is cast into an ingot—say an inch thick, 10 inches wide and 2 feet long.

The ingot is then passed between rollers and rolled down to a thin plate. The rolling is performed while the metal is cold; no annealing being required during the process as in rolling gold.

By means of massive machines, blanks are then punched from the plates of suitable size to make spoons, forks, teapots, &c.

Then comes the process of fashioning the articles into the proper forms for use and ornament. Several methods are employed for effecting this. A portion of the articles are placed upon an engraved steel die, and a mass of cast iron is allowed to drop upon it from a sufficient hight to press the silver into the die and mold it in correspondence with the engraving. The bowls of the spoons are formed by laying the blank upon a lead matrix of the proper form, resting the end of a rounded steel punch upon it, and giving the punch a powerful blow with a sledge. Tea pots and similar articles of hollow ware are fashioned, by cutting a thin plate of metal into a suitable form, bringing the edges together and soldering them, and then beating the metal with hammers, drawing it into the proper shape by the same process as that employed by a blacksmith in making a ladle. Many hammers of a great variety of forms are used in this operation of raising, as it is called. Round articles, as the covers of tea pots, are spun upon a lathe in the usual way.

There are several processes of ornamenting. The most interesting of these is by means of lathes. The lathes are quite as perfect in workmanship and more complicated in construction than the lathes employed in bank-note engraving. Very complex contrivances are employed to give the tool the various motions required. In marking concave surfaces, for instance, the tool is always kept at right angles to the surface, and when occasion requires a vibrating motion is imparted to it, producing the beautiful waved lines so often seen on napkin rings. The chasing is done with a steel punch and hammer, and to prevent the ware from being forced out of shape in the operation, the vessel is filled with pitch. After the chasing is completed, the vessel is inverted in a warm oven, when the pitch is melted and flows back into the kettle, from which it may again be dipped. Some engraving is executed by hand, and cast ornaments are soldered to urns, pitchers, &c.

After the ornamenting is completed, the ware is cleaned and polished. The first operation in this part of the process is to scour it with sea-horse hide covered with sand. I saw a piece of natural hide $1\frac{1}{4}$ inches in thickness. It is then scoured with rotten stone, and lastly with oxide of iron, called rouge. The rouge is applied first with a bob made of disks of woolen cloth fringed at the periphery, then with a similar bob of cotton, and lastly with that most perfect of all cushions, the human hand. The thumbs of the workmen engaged in this last labor become as thick and tough as leather.

One of the most interesting parts of the cleaning process is the pickling. The vase or bowl is placed upon a turntable so that it may be revolved, and is heated red hot by a flame; the rotation being for the purpose of heating the vessel on all sides equally and at the same time. The flame is formed by two currents, one of illuminating gas and the other of atmospheric air, caused to mingle as they issue from the jet. The current of air is driven through its pipe by a fan and issues in a flaring flame a foot long, enveloping the ware and very quickly bringing it to a red heat. The heat oxidizes the alloy in the surface of the ware, and this oxide is then dissolved by placing the vessel in a bath of warm dilute sulphuric acid. This leaves the surface pure silver and of that soft lusterless white, which is sometimes left on the ware, and which is so beautiful. When a luster is desired this pure silver surface is rubbed down with a burnishing tool, or it is otherwise polished. Some of the burnishing tools are made of steel, and some of bloodstone.

The only remaining steps in the process are to pack the ware, send it to market, sell it and get the pay. Mr. Gorham told us that they received one remittance in gold from an old customer in New Orleans some time after the act of secession was passed in Louisiana.

Very few workmen are now employed in the establishment, but in ordinary times, 1,000 dollars in coin is melted every day, and more than two tuns of silver are constantly going through the process of manufacture. The designs are formed in clay and wax and are then produced in plaster or copper, and are preserved for publication in case that it is required. The designer's room is a large neat office, and contains a library of the most costly works on ornamental art.

RECENT AMERICAN INVENTIONS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list on another page:—

Tension Regulator for Sewing Machines.—The object of this invention is to increase the tension of the needle thread of a sewing machine in the same measure as the diameter of the bobbin in the shuttle decreases, and consequently the tension of the shuttle thread increases. The invention consists in the arrangement of a pulley with a long conical hub, said pulley being rotated by the action of the needle thread, in combination with a screw spindle and spring pad acting on the conical hub in such a manner that, during its operation of sewing and consequent decrease of the bobbin on the shuttle, by the action of the screw, the pulley assumes a gradual downward motion, thereby bringing thicker and thicker parts of the conical hub opposite the spring pad and causing a corresponding increase in the tension of the needle thread. The inventor is Paul Pryibil, of New York city.

Explosive Projectile.—This invention consists, first, in a certain arrangement of obliquely expanding wings, for the purpose of obtaining a rotary motion of a projectile about its axis by the resistance of the atmosphere to its flight when fired from a smooth-bored gun. Second, in a certain mode of combining one or more expanding wings and nipples or their equivalents, for the reception of percussion caps or other percussion priming, in an explosive projectile, for the purpose of making such wings constitute hammers by which the said priming is exploded on the projectile striking. The inventor is William E. Browne, of Valley Falls, R. I.

Hotel Indicator.—The object of this invention is to obtain a device by which the number of drinks dealt out at a bar may be registered and counted by the proprietor, thereby serving as a check to the barkeeper through whose hands the money passes into the till. It consists in the employment of a box provided with a ball receptable and having a series of compartments in it which are numbered and provided with a tilting bottom placed over a drawer. This drawer receives the balls inserted in the compartments by the customers and which indicate the number of drinks that have been dealt out by the barkeeper. The inventor is James McNamee, of Easton, Pa.

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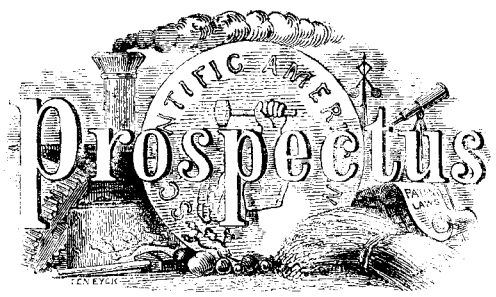

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VOLUME VII.—NEW SERIES.

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The SCIENTIFIC AMERICAN has the reputation, at home and abroad, of being the best weekly journal devoted to mechanical and industrial pursuits now published, and the proprietors are determined to keep up the reputation they have earned during the seventeen years they have been connected with its publication.

The SCIENTIFIC AMERICAN is indispensable to every inventor, as it not only contains illustrated descriptions of nearly all the best inventions as they come, but each number contains an Official List of the Claims of all the Patents issued from the United States Patent Office during the week previous; thus giving a correct history of the progress of inventions in this country. We are also receiving, every week, the best scientific journals of Great Britain, France and Germany; thus placing in our possession all that is transpiring in mechanical science and art in these old countries. We shall continue to transfer to our columns copious extracts from these journals of whatever we may deem of interest to our readers.

No person engaged in any of the mechanical pursuits should think of doing without the Scientific American. It costs but four cents per week; every number contains from six to ten engravings of new machines and inventions which cannot be found in any other publication. It is an established rule of the publishers to insert none but original engravings, and those of the first-class in the art, drawn and engraved by experienced artists, under their own supervision, expressly for this paper.

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WAR! WAR! WAR!

Our summary of the war news, which has been so highly complimented by our readers and cotemporaries, will be continued in the coming volume so long as the war lasts, accompanied with copious illustrations of new war implements of various kinds, such as cannon, firearms, projectiles, &c., &c.

TO ALL WHO CAN READ!

Everyone who can read the English language, we believe, will be benefited by subscribing for the Scientific American, and receiving its weekly visits; and while we depend upon all our old patrons renewing their subscriptions, we would ask of each to send us one or more new names with his own. A single person has sent us as many as a hundred mail subscribers, from one place, in a single year! The publishers do not expect every one will do as much; but if the five thousand subscribers, whose subscriptions expire with the present volume, will each send a single name with their own, they will confer a lasting obligation upon us, and they shall be rewarded for it in the improvement we shall be enabled to make in the paper by thus increasing our receipts. The following are the

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ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JUNE 10, 1862.

Reported Officially for the Scientific American.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 2, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

35,497. James Adair, of Pittsburgh, Pa., for Improvement in Condensers for Oil Stills :

I claim the use of a worm chest, constructed substantially as described, immersed in a vat or vessel of water, for the purposes set forth.

Causing the oleaginous vapor to be condensed, to pass through a zig-zag passage one side of which is a water surface, in order to secure a more rapid condensation, and to enable the condensed fluid to be drawn off at different points, in the manner described,

So constructing the worm chest of the condenser as to separate the different qualities of oil by partitions, which the condensed fluid cannot pass, but which present no obstacle to the flow of the uncondensed vapor and gas through the worm, for the purpose set forth.

Admitting the cold water in a shower into the worm chest at its rear end by a perforated pipe, through which the gas and uncondensed vapor are compelled to pass in their exit from the condenser, substantially as and for the purpose described.

35,498.—J. R. Agnew, of Mercersburgh, Pa., for Improvement in School Globes :

I claim a globe made of textile fabrics either alone or combined with and strengthened, if desired, by wire netting or leather, substantially in the manner and for the purposes described.

[This invention consists in the employment or use of textile fabrics made either of mineral, vegetable or animal substances, or of leather, or such textile fabrics combined with each other or with leather, and strengthened if necessary by means of metal wire or other suitable material, for the purpose of manufacturing terrestrial, celestial, or terra-celestial globes.]

35,499.—A. G. Bradford, of Freeport, Ill., for Improvement in Chain Pumps :

I claim the combination of the buckets, with the handles and connecting rings, when used for the purpose of elevating water, or other fluids, substantially as specified.

35,500.—S. R. Brann, of Hillsboro', Ill., for Improvement in Dampers :

I claim the arrangement of the spring, E, in combination with double crank shaft, B, damper, A, rod, D, and stove pipe or flue, C, all constructed and operating substantially in the manner and for the purpose shown and described.

[This invention consists in connecting the expansion rod with the damper by means of a double crank shaft and spring, in such a manner that an expansion of said rod beyond a certain degree exerts no injurious influence on the connections or on the damper, and that when the damper is once closed and the rod contracts or expands, the entire strain exerted by the rod is thrown on the spring.]

35,501.—H. L. and C. P. Brown, of Shortsville, N. Y., for Improvement in Grain Drills :

I claim, first, The arrangement of the flanched disks, B C, circular channel, n, and adjustable gaging device, E, substantially in the manner and for the purpose described.

Second, The arrangement of the flat-sided shaft, D, disk, C, with inner hub, c, and stationary disk, B, with box, b, substantially in the manner and for the purpose described.

Third, The arrangement of the cut-off, F, and outer extension of the box, b, in combination with the inlet orifice, f, substantially in the manner and for the purpose described.

35,502.—N. T. Brown, of Ononwa, Iowa, for Improvement in Horse Rakes :

I claim the combination of the bars, B' B', with the straight rake teeth, e, rake head, a, slide, D, rod, E, slotted lever, G, and reversible lever, H, all in the manner and for the purpose shown and described.

[This invention relates to an improved rake of that class which are drawn by a horse or team, commonly termed horse rakes. The invention consists in the employment of a revolving rake and a stop attachment applied to a frame, and so arranged that the driver or attendant may, while either riding or walking, operate the stop attachment with the greatest facility to cause the rake to revolve and deposit its load, and then to stop the rake at the proper moment in order that it may load itself by the draft movement.]

35,503.—W. E. Browne, of Valley Falls, R. I., for Improvement in Explosive Projectiles for Ordnance :

I claim, first, The arrangement of the expanding wings, D D, to swing from recesses in the sides of the body of the projectile upon pins, c c, arranged obliquely to planes passing through the axis of the projectile, substantially as and for the purpose set forth.

Second, The combination of one or more expanding wings, D D, attached to the body of the projectile and one or more nipples, or their equivalents, provided on the said body for the reception of percussion caps or other percussion priming, whereby the said wings are made to constitute hammers for the explosion of the percussion priming, substantially as specified.

35,504.—T. J. Campbell, of Lincoln, Ill., for Improvement in Automatic Revolving Ordnance :

I claim, first, The application of the copying belt, operated by the action of the cylinder, B.

Second, I also claim the lubricating box, o, in combination with the reciprocating swab, m, and ramrod, n, substantially as set forth.

35,505.—P. S. Carhart, of Collamer, of N. Y., for Improvement in Cultivators :

I claim the means, substantially as shown and described, for regulating the depth of the penetration of the teeth, B, of the implement in the ground, to wit, the attaching of the draft pole, C, to the front bar, a, of the frame by a bolt, d, and having its back end connected to the back bar, a, of the frame by a rack plate, E, lever, F, provided with a toothed segment, i, and an adjustable pin, j, which fits in notches, f, in the plate, E, to operate as set forth.

[This invention relates to an improvement in that class of cultivators designed to be drawn by two horses, and be capable of being adjusted higher or lower, so that the latter may penetrate a greater or less distance into the earth, as circumstances may require.]

35,506.—Gardner Chilson, of Boston, Mass., for Improvement in Parlor Stoves :

I claim the separate grate rotator as made, not only with a grate attachment or device for connecting the grate with it, but with a head or its equivalent, for receiving a key or lever.

I also claim the construction of the ashpit mouth frame with a socket for the reception of the said grate rotator, made separate from the grate, and also in manner and so as to operate the grate, as specified.

I also claim the arrangement of the conical enlargement ring, the fire chamber, the oven and the flue spaces about the sides and top of the oven.

35,507.—G. F. J. Colburn, of Newark, N. J., for Lamp Reflector and Chimney Protector :

I claim the arrangement and construction of a metal shield and reflector for lamp chimneys in the manner and for the purpose specified.

35,508.—Asahel Cooley, of Chicago, Ill., for Improvement in Pumps :

I claim, first, The manner described of felling the cylinder above the piston, to wit, by the employment of the induction ring valve, e e, surrounding the bore of the cylinder at the top of the same, the posts, e e e e e e, of which being so arranged as to direct the water underneath said valve, e e, or be closed by the falling of the same, substantially as described.

Second, The eduction passages, l r s t, or their equivalent, so constructed and arranged as to receive the water above the piston, and convey it underneath and through the eduction valve, i', substantially as described.

Third, The tubular piston rod, F, and eduction valves, i and S, arranged and operated substantially as described,

Fourth, The parts, g C and d d, arranged substantially as described, when combined with a pump cylinder and the tubular piston rod, F, for the purposes set forth.

35,509.—F. W. Dahne, of Swansea, Glamorganshire, Great Britain, for Improvement for Extracting Copper from Ores. Patented in England Sept. 26, 1860 :

I claim the roasting a mixture of copper ore with sulphate of iron so as to convert the copper into sulphate and the iron into peroxide, and then separating the sulphate of copper by lixiviation, as described.

35,510.—J. S. De Haven, of North Springfield, Ohio, for Improvement in Grain Drills :

I claim the combination of the inclined and tapering metal tube, A, with the peculiarly-shaped metal tooth, as represented, and the spreading bolt, I, constructed, combined and arranged in relation to each other, as shown and described.

35,511.—Henry Evans, Jr., of Baltimore, Md., for Improvement in Apparatus for Steaming Oysters :

In combination with a steam box I claim the cars and tracks constructed and arranged substantially as described.

35,512.—J. U. Fiester, of Winchester, Ohio, for Improvement in Cooking Apparatus :

I claim the combination and arrangement of the top plate, E, middle plate, D, lower plate, C, and baker, B, so as to form an improved apparatus for cooking before grates, constructed and operating substantially in the manner and for the purposes set forth.

35,513.—F. G. Ford, of New York City, for Improvement in Window Sash :

First, In the described combination with the movable beads, C', I claim attaching the suspension cords, F, to the sash by means of hooks, H, placed in cavities in the edges of the sash, admitting of the ready and complete removal of the sash from the window frame.

Second, I claim fastening the upper and lower sash together by means of a screw, M O P, guided by a pin, N, in the socket, L, so as to be retracted within the socket when the sash is to be raised or lowered, and protrude from the said socket and enter and bind within the nut, K, when the sash is to be raised or lowered and protrude from the said socket and enter and bind within the nut, K, when the sash is to be secured, all as explained.

35,514.—William Fradgley, of Greenbush, N. Y., for Improved Cork Screw :

I claim the screw, K, and handle shaft, L, with their coupling heads, e and r, and their socket, a, the pin, p, in the shaft with its notch, f, in the top of the cylinder, E, the cylinder, E, with its groove, G, and pin, H, of outer cylinder, A, the whole operating together as a cork-screw, substantially in the manner set forth.

35,515.—John Gibson and Michael Heberger, of Cincinnati, Ohio, for Improvement in Hydrants :

We claim the combination of the elbow, C e, screw-shanked cork, D, annular gasket, G, scutcheon, E e, and clamp nut, F, all constructed, arranged and employed in the manner and for the purposes set forth.

35,516.—Simeon Grover and Stephen Putnam, of Newton, Mass., for Improvement in Coal Sifters :

We claim the sifter, composed essentially of the inclosing and supporting rim, A, the suspension cross, or rim, C, and shaking handle, b, with their appendages, constructed and arranged so as to be used in connection with a common cask or barrel and coal sieve, substantially as specified.

35,517.—J. C. Hall, of Cincinnati, Ohio, for Improved Sofa Convertible into a Table, Trunk, Cot, &c. :

I claim the arrangement of box, A a a', seat, G, ledge, G', and hinges, E, hinged and folding back, B B' F, the whole forming a convertible cot, settee, desk and table, as described.

35,518.—A. G. Heckrotte, of New York City, for Improved Washing Machine :

I claim the combination of the rollers, b, the cylinder, D, and the spring bearings, i, when constructed and arranged substantially in the manner described and for the purpose specified.

And I also claim the application of the rubbing cylinder when constructed with fixed revolving rollers, as described, in combination with the concave of rollers, b, as set forth.

35,519.—V. W. Houck, of Buffalo, N. Y., for Improvement in Crozing Machines :

I claim, first, The endless revolving bed, composed of the jointed links, D, the said links being so constructed that a transverse surface line, will correspond to an arc of the longitudinal curve of the barrel, or nearly so, for the purposes and substantially as described.

Second, Supporting the shafts, B', and hence the drums, B, in yielding journal boxes, b2, in combination with the described endless revolving bed, for the purposes and substantially as set forth.

Third, Wheel formers made adjustable horizontally on the cross-piece, O, and placed on a line corresponding to the longitudinal curve of the barrel, for the purposes and substantially as set forth.

35,520.—H. N. Houghton, of Halifax, and C. H. Denison, of Brattleboro', Vt., for Improvement in Shells for Rifled Ordnance :

I claim the employment of the screw bolt, F, applied as and for the purpose specified, as a fuse tube, substantially as described.

[This invention relates to the construction of the body of an elongated projectile of two or more pieces with interposed packing rings, the whole connected by a central screw bolt, which projects through the head of the projectile for the reception of a wrench by which it may be screwed up after the insertion of the projectile in the gun, for the purpose of drawing the said pieces together, and thereby so expanding the packing rings as to prevent windage in firing, and to make the packing enter the rifle grooves in case of the gun being rifled. The improvement consists in the employment of the aforesaid screw as a fuse tube by making it hollow for the reception of the fuse.]

35,521.—C. T. James, of Providence, R. I., for Improvement in Explosive Shells for Ordnance :

I claim, in combination with the conically-shaped base of the shot of hard metal, an expansible base piece of soft metal, arranged to operate substantially as described for the purpose set forth.

35,552.—E. A. Jeffery and J. D. Quackenbush, of Corning, N. Y., for Improvement in Pumps :

We claim, first, The combination and arrangement of the cylinder, A, with the parts constituting the valve chambers, D D, and with the packing chamber, H, so as to secure the suction and discharge pipes, G G and F F, in sockets in their respective parts, substantially in the manner and for the purpose shown and described.

Second, The india rubber rings, b b, and perforated screw rings, d d, so constructed and arranged as by their compression to pack not only the piston, but the joints, a a, of the cylinder, substantially as shown and described.

Third, The passage, K, for admitting water to the stuffing box of the piston rod and maintaining it there under the discharge pressure of the pump, substantially as and for the purposes set forth.

Fourth, In combination with the foregoing, the perforated tube, p, and gasket, r, for excluding water from entering the cylinder from the stuffing box, substantially as set forth.

35,523.—George Jones, of Peekskill, N. Y., for Improvement in Sash Fasteners :

I claim the application of the yoke, swinging on a hinge, to the inclined plane, provided with notches, thus producing a perfect window-sash fastener and securing the effects described.

35,524.—Horatio R. Jones, of Addison, N. Y., for Improvement in Percussion-Cap Primer, for Firearms :

I claim the spring catch attached to the rear end of the capping tube to hold the trough or slide in its place, substantially as and for the purposes set forth.

35,525.—O. S. Judd, of New Britain, Conn., for Improved Means of Extinguishing Gas Lights :

I claim the sector, c, applied to the gascock and moved by a spring, or its equivalent, to shut off the gas, when the latch lever, g, is disconnected by the clock mechanism, as and for the purposes set forth.

35,526.—J. W. Kingman, of North Bridgewater, Mass., for Improved Mode of Making Buildings Waterproof :

I claim the new mode of rendering surfaces, &c., waterproof, the same consisting in applying, by rubbing to such surfaces, thin sheets of fibrous materials first coated with such a paste or cement as will permit waterproof liquids to pass through and then saturating them with such waterproof liquids as will pass through both the cloth and the paste, substantially as described.

35,527.—Sylvester Louis, of Rochester, N. Y., for Improved Mode of Treating Oils and Fats, for Rendering them more Useful for Burning in Lamps, Lubricating Machinery and other Purposes :

I claim the treatment of vegetable and animal oils and fats, by the use of benzole or naphtha and annotto combined, substantially in the manner and for the purposes described.

35,528.—Lafayette Louis, of Buffalo, N. Y., for Improvement in Pianos with Melodeon Attachment :

I claim, first, The arrangement of a melodeon tube board, including reeds and swell, above the keys and below the sounding board of a pianoforte, in the manner and for the purpose and substantially as described.

Second, So combining and arranging a melodeon tube board with a pianoforte as that the performer can instantly and at pleasure disconnect the melodeon tube board from the pianoforte keys, in the manner substantially as set forth.

Third, The combination and arrangement of the tremelo, G, with the melodeon tube board, E, and pianoforte, substantially as described.

Fourth, The combination of a compound rotary bellows with a pianoforte and melodeon, the bellows being provided with a valve, I2, for regulating the degree of air pressure upon the melodeon reeds, substantially as set forth.

35,529.—W. W. Lyman, of West Meriden, Conn., for Improved Fruit Can :

I claim producing the openings, e, in combination with the stopper, a, and ring, b, substantially in the manner and for the purpose described.

35,530.—E. A. McAleer and J. Shively, of Canton, Ohio, for Improvement in Weighing Faucets :

I claim, first, The combination with valve, C, of the platform, and peculiarly constructed weighing-scale beam, E, substantially as set forth.

Second, The combination of the rear valve, e, main valve, C, with the spigot, substantially as and for the purposes set forth.

35,531.—R. W. McClelland, of Springfield, Ill., for Improvement in Hubs and Journals for Carriage Wheels :

I claim, first, In connection with a cast-iron hub made in two sections, the driving in of the spokes radially into one of the sections, in combintation with the shoulder, recess, flanges and screw threads, to brace and bind the two sections to each other and to the arched part of the spokes, substantially as described.

I also claim, in combination with a cast-iron hub, sectional, adjustable, and removable metal boxes to take the bearings of the journal, substantially as and for the purpose set forth.

I also claim, in combination with sectional adjustable boxes in the hub, the removable bearings on the journal of the axle, substantially as and for the purpose set forth,

35,532.—J. W. Merrill and J. H. Rowe, of Boston, Mass., for Improvement in Feet-Warming Apparatus :

I claim the separate foot case or cases as combined with and applied to the stand, and made substantially in the manner and so as to operate as described.

35,533.—W. O. B. Merrill, of Philadelphia, Pa., for Improvement in Coal-Oil Burners :

I claim, first, The smoke consumer composed of a metal plate with the flat projections, f f, and turned-up projections, d and d', when arranged within the perforated casing, A, of a coal-oil lamp burner, as and for the purpose set forth.

35,534.—W. O. B. Merrill, of Philadelphia, Pa., for Improved Coal Oil Lamps for Railway Cars :

I claim the chimney composed of the hollow metal cap, B, glass tube, A, and metal base, C, with the projections, E, and E', or their equivalents, for the attachment or suspension of the chimney to the side or roof of a car or to any other object, in combination with the detachable reservoir, D, and its burner.

Second, The projections, s s, on the reservoir, in combination with the openings, m m, on the flange, i, of the base, C, the spring, c, its rod, b, and the stop, a.

Third, The combination and arrangement of the base, C, flange, e, perforated flange, i, and perforated cap, H.

35,535.—W. O. B. Merrill, of Philadelphia, Pa., for Improvement in Lamp Chimneys :

I claim a lamp chimney, composed of a metal base, A, with an annular projection adapted to the burner of a lamp, and two or more plates of plain glass confined by metal ribs or plates, substantially as and for the purpose set forth.

I also claim hinging one or two more of the said plates or ribs to the base, and confining the same at the top, by the attachable cap, G, as specified.

35,536.—Franklin Miles, of Rochester, N. Y., for Improvement in Fanning Mills :

I claim compounding the motion of the shoe or shoes when shaken horizontally, by the addition of the abrupt vertical vibration or jar, by means of the double bearing, H, of the rock shaft, c, and the sockets, g g, substantially as and for the purposes described.

I also claim the combination and arrangement of the grass-seed box, C, hopper, S, sieve, m, and fan, F, substantially as and for the purposes described.

I also claim the feed board, L, provided with the guide stem, T, and spring, n, when used in combination with the hopper for adjusting and holding the same, substantially as set forth.

35,537.—N. W. Northrup, of Greene, N. Y., for Improvement in Railroad Chairs and Rails :

I claim a double-headed rail with the ribs or flanges and shoulders, with the chair composed of the two jaws, grooves, flanges, slots, and wedge shape movable jaw, combined as specified and for the purposes set forth.

35,538.—J. H. Norton, of Boston, Mass., for Improvement in Gas Regulators :

I claim the chamber, G, into which the gas is poured from the inlet pipe, H, in combination with the valve, f, communicating with the pressure chamber, D, when said valve is commanded by the quicksilver cup, M, suspended directly from the inverted cup, C, substantially as specified.

35,539.—M. P. Norton, of Troy, N. Y., for Post Office Way-Bill Envelope :

I claim a Post Office way-bill envelope, constructed substantially as and for the purpose described and set forth.

35,540.—Jonathan Parker, of Biddeford, Me., for Improvement in Churns :

I claim the dasher as made with perforations, arranged at an inclination to its faces, to operate in manner substantially as specified.

35,541.—Moses Pond, of Boston, Mass., for Improvement in Heaters :

I claim the upper joint of the pipe, consisting of the cup or its equivalent, with the sand and the collar, N, with its elongated slots, K K', and the rim projecting into the cup or its equivalent, all constructed substantially as above specified and operating as described, so as to allow the expansion and contraction of the pipe, and at the same time, by making the joint air tight to prevent gas and smoke from escaping into the hot-air chamber.

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35,542.—Paul Pryibil, of New York City, for Improved Tension Regulator for Sewing Machines :

I claim, first, The arrangement of the friction pulley, D, with the connical hub, E, in combination with the screw spindle, G, and spring pad, F, constructed and operating substantially as and for the purpose specified.

Second, The arrangement of the elliptical nut, d, on the spring, H, in combination with the screw spindle, G, and pulley, D, substantially as and for the purpose described.

Third, The recess, e, and shoulder, on the screw spindle, G, in combination with the lower part, g, of the nut, d, as and for the purpose set forth.

35,543.—M. A. Richardson, of Sherman, N. Y., for Improvement in Machine for Working Butter :

I claim the employment of the tub, G, worker, H, and shaft, D, with the arm, C, and hinged extension, C′, the several parts being constructed and arranged to operate in the manner and for the purpose specified.

Second, The use of the lever, a, upon which the bottom of the shaft, D, is situated, or in which it has its bearings for the purpose of throwing out of gear the lower end of said shaft, as is fully set forth.

Third, The use of the bar, L, lever, M, and scale, N, when used with the standard, B, as and for the purpose specified.

35,544.—Michael Ritner, of Vincennes, Ind., for Improvement in Sabot for Projectiles of Rifled Ordnance :

I claim a hollow sabot of vulcanized india rubber, constructed substantially as described, and applied in the rear of a cannon ball or other projectile without enveloping the same or being attached thereto ; constituting a cushion to receive the percussive force of the explosion, and adapted to expand by the pressure of the gases so as to effectually prevent their escape.

[The object of this invention is to permit the use of leaden projectiles in guns of large caliber. The sabot is made to act both as a cushion and a packing, and prevents the slugging of the ball either by the heat, friction or percussive force of the gases.]

35,545.—Henry Ruth, of Summerfield, Ill., for Improvement in Corn Planters :

I claim, first, In combination with the rollers, L, the toothed curved plates, M, arranged in a hinged frame as described.

Second, The cam, F, in combination with the valve, E, constructed and arranged as described.

35,546.—J. L. Sater, of Cincinnati, Ohio, for Improvement in Planting Machines :

I claim the combination of the hollow perforated open cylinders, B B, with the grain boxes, A A, when the said hollow cylinders are combined with the obliquely-perforated segmental blocks, D D, and the conducting tubes, E E, in the manner and for the purpose substantially as set forth.

35,547.—W. C. Shipherd, of Saratoga Springs, N. Y., for Improved Boot-Crimping Device :

I claim the notches, i o, made respectively in the tree, E, and plates, k k, of the clamp, G, as shown, in combination with the clamp formed of the nuts, p, screw rods, p′, and clasps, q, all arranged as shown for the purpose of securing the crimped leather to the tree.

[This invention consists in the employment of a boot-tree attached to a sliding frame, in such a manner that it may be readily removed therefrom when necessary, in connection with a crimping clamp and a series of tree clamps, all being so constructed and arranged that the uppers and legs of boots may be neatly crimped at a single operation, and then secured to the tree with great facility.]

35,548.—J. N. Smith, of Jersey City, N. J., for Improvement in Repeating Firearms :

I claim, first, Ejecting the charge case laterally from the bore of a gun, through an opening made in the side of the bore, in the manner substantially as described.

Second, The employment of the carrier, F, or its equivalent for opening the gun to introduce the charge, substantially as set forth.

Third, I claim the arrangement of the feed wheels, M, and N, the same being connected by the spring, j, and forming a compound wheel for bringing forward the charges automatically and with precision, as specified.

35,549.—J. N. Smith, of New York City, for Improvement in Coal-Oil Lamps :

I claim the flexible lifting cup, L, constructed and operating substantially as and for the purpose specified.

I also claim the combination of the flexible lifting cup, L, and disk, J, united and arranged with their apertures, l, and j j, substantially as and for the purpose set forth.

I also claim the evaporating tank, P, with its open aperture, p, or its equivalent, substantially as described and applied to the lamp for the purposes specified ; and this I claim whether arranged and applied as described, or in any other way combined with a lamp to produce the effects, and for the purposes set forth.

I also claim the safety valves, F G, and K, applied to the oil passages, and operating substantially in the manner and for the purposes described.

I also claim the employment of a retort, for vaporizing the oil at the burner of a lamp, substantially as and for the purpose specified.

I also claim the separate oil chamber, r, in the retort, so arranged as to cut off or let on the supply of oil thereto from the oil reservoir at pleasure. substantially as specified.

I also claim the separate vaporizing chamber, X, in the retort, arranged so as to be cut off from, or connected with the oil chamber, r, substantially as set forth.

I also claim the retort cap, T, arranged so as to regulate or close the flame orifice of the burner, substantially as specified.

I also claim the rarifying chamber, V, substantially as and for the purposes set forth.

I also claim the chamber, W, arranged and operating substantially as and for the purpose specified.

I also claim the radiating cone, U, constructed, arranged and operating substantially as and for the purposes set forth.

I also claim the small auxiliary burner, situated within the rarefying chamber, V, substantially as and for the purposes specified.

I also claim the double cone, Y, arranged and operating in combination with the small burner, substantially in the manner and for the purposes described.

I also claim the register plate, Z, for controlling the introduction of the draft air and vapors into the rarefying and blaze chambers, V W, in combination therewith, substantially as and for the purposes specified.

35,550.—B. F. Southgate, of Bridgewater, Vt., for Improved Sawing Machine :

I claim the levers, N N, provided with the pawls, O, and operated from the saw gate or sash as shown, in combination with the ratchets, M M, shafts, L, and the cords or chains, K, or their equivalents, all arranged substantially as shown for giving the feed movement to the carriages, I, as set forth.

[This invention relates to a new and improved sawing machine of that class designed more especially for sawing small stuff, as for instance fellies for wheels, scroll work and the like. The object of the invention is to obtain a machine which may be used with either one or two saws in the same gate or sash, and be provided with a simple automatic feed mechanism, all being so arranged that both saws may be used simultaneously on different work, or either used separately, as may be desired.]

35,551.—James Spear, of Philadelphia, Pa., or Improvement in Stove Doors :

I claim the combination of the openings, b b′, at the bottom of the door and the opening, a a′, at the top of the frame when in connection with the mica and metal plate or wire gauze, constructed substantially as described.

35,552.—Albert Taplin, of Providence, R. I., for Improved Burner for Coal Oil Lamps :

I claim turning the rim of the cone upward at, A A, and outward at B B.

35,553.—James Thierry, of Aurora, Ill., for Improvement in Machines for Turning of Grindstones :

I claim the combination of a circular cutting tool, C, a spindle, D, and a frame, F, together with the wedges, K K′ K″ K‴, or their equivalents, with a grindstone-turning machine so constructed that it will operate by the joint effects of its contact with a grindstone in motion, and the inclination of said spindle in relation to said grindone, as described above substantially.

35,554.—G. M. Thomas, of New York City, for Improved Lemon Squeezer :

I claim a cast metal lemon squeezer, composed of two handles, A A′, connected at their front ends by a fulcrum pin, a, and provided respectively with bowls, B C, one fitting within the other and below the handles, substantially as described.

[This invention consists in constructing the squeezer of cast metal and of such form or in such a manner that a very durable, economical and light implement for the purpose is obtained, and one that may be manipulated or operated with greater facility than the ordinary kinds in general use.]

35,555.—C. A. Wheelock, of Uxbridge, Mass., for Improved Steam Trap :

I claim my improved steam trap, as made substantially as before described ; that is to say, not only with an abutment, E, and with the valve and stem separate from such abutment, and movable with the pipe as explained, but with the valve so arranged as to be closed by pressure of the steam, and opened by contraction of the pipe under circumstances, substantially as above set forth. And, furthermore, in connection therewith, I claim my improved arrangement of the valve seat or the same, and its exhaust passage relatively to the valve stem and its stuffing box, whereby the latter is separated or insulated from the pressure of the steam of the expansion pipe, as specified.

35,556.—E. A. Wible, of Georgetown, Cal., for Improvement in Preserving Grapes and other Fruit :

I claim the packing of fruit sprinkled with powdered alum in layers, between layers of dry sand, in air-tight boxes, substantially as specified.

[This invention is stated by the inventor to be capable of preserving grapes in their natural state for a year. The claim describes its nature.]

35,557.—G. G. Wolfe, of Troy, N. Y., for Improvement in Stoves :

I claim the combination of the partition, F, with the fire cylinder, B, substantially as described and set forth.

35,558.—W. A. Wood, of Hoosick Falls, N. Y., for Improvement in Harvesters :

I claim, first, Uniting the platform to the main frame by the bent rod, a, and hinged rod, e, and their appliances, so that the platform may be raised or lowered on the main frame, substantially as described.

I also claim the plate, d, as forming a hinged support to the rod, e, and a means of uniting the platform and finger bar, substantially as described.

I also claim the device for raising and lowering the outer side of the platform, namely, the sleeve and its adjusting holes on the arm or outside wheel supporter, E, and similar adjusting holes in the rod, e, and a pin or key passing through them, substantially as set forth.

35,559.—A. J. Bowen (assignor to himself, and L. K. Bowen), of Baltimore, Md., for Improvement in Tobacco Pipes :

I claim the two tubes or channels, a, and b, in the stem, in combination with the bowl, c, and cup or receptacle, d, as set forth.

45,560.—J. E. Everett (assignor to W. Everett and Co.,) of Dedham, Mass., for Improved Wringing Machine :

I claim the above described water-conducting attachment for clothes wringers, consisting of the conducting box with its longitudinal partition, c, and trough, D, which may be moved to either side of the partition, substantially as specified.

35,561.—J. H. Fairchild (assignor to himself, and C. P. Stimets), of Highgate, Vt., for Improved Sap Bucket for the Manufacture of Maple Sugar :

I claim the combination of the cement and box for the specific purpose of catching sap or a sap bucket to be used in the manufacture of maple sugar.

35,562.—Hezekiah Conant (assignor to the Willimantic Linen Co.), of Willimantic, Conn., for Improvement in Machines to Label Thread Spools :

I claim, first, The combination of feeding, holding, punching, pasting, applying and ticket-presenting apparatus, all substantially such as described.

Second, I claim the combination, substantially as described, of feeding, withholding mechanism or apparatus, and I claim these in combination with applying mechanism only substantially such as specified or in combination with punching out and applying mechanism, substantially such as specified.

Third, I claim punching out and applying mechanism substantially such as described in combination with pasting mechanism, substantially as specified.

Fourth, I claim a ticket-presenting apparatus, substantially such as described, in combination with punching and applying mechanism, substantially such as specified.

Fifth, I claim the combination of punching with applying mechanism, each having a mode of operation, substantially as set forth.

Sixth, I claim in combination with ticket-presenting mechanism substantially such as described a holding mechanism, substantially such as specified.

Seventh, I claim in combination a rack, a bolt and a frame provided with projections, all substantially such as specified and operating as described.

Eighth, I claim in combination a carriage, a rack, and a bolt, substantially such as described, in combination with a frame having projections thereon as specified.

Ninth, I claim in combination a rack, a carriage, and a bolt, and two pawls provided with proper mechanism, substantially such as described for causing them to act alternately, as specified.

Tenth, I claim a feeding trough adjustable toward and from a gate, substantially as described, in combination with a forked gate, whose range of motion is adjustable, whereby the same holding mechanism may be adapted to hold and center articles of different size.

Eleventh, In combination with a trough or lower support for a spool or similar article, I claim two forked gates, each having an independent downward motion substantially as specified, whereby articles of different diameter at opposite ends may be more accurately held, when acting in combination with proper mechanism for applying labels or tickets thereon.

Twelfth, I claim in combination ticket presenting, punching, applying and pasting mechanism, all substantially such as described.

35,563.—George Cook, of Bristol Station, Ill., assignor to himself and William Scarlett, of Aurora, Ill., for Improvement in Harrows :

I claim, first, Inclining the teeth of a harrow at the will of the operator, so as to discharge the obstructions accumulated therein, and restoring the same to their positions for working, without lifting the harrow, all substantially in the manner set forth.

Second, The arrangement of the teeth A, beams 1 2 3 &c., eyes C C′ and D D′, and any suitable force for extending and contracting the same, so as to operate as set forth.

Third, The employment of the lever, F, and links, H, as arranged relatively to the beam, 1 2 3 &c., and to the eyes, C C′ and D D′, and links, c and d, as to operate as set forth.

Fourth, The uniting or connecting of the rods, H, to an eye, G, which is higher than the eye or steeple, E, to which F is connected so that the extending and contracting force applied to the harrow by the elevation and depression of F, shall act diagonally in the vertical plane as set forth.

Fifth, I claim connecting the lever, F, and the drag link, B, to a point, E, forward of and lower than the center of the front beam 1, substantiallially as and for the purpose set forth when the parts are arranged relatively to the several other cross beams, 2 3, &c., and their connections, and to the links or bars, H, as shown.

Sixth, I claim securing the lever, F, in different positions by means of the notches, i i′, in the posts I, in combination with the other parts, substantially as represented, for the purpose of holding the teeth firmly in the several positions desired for working in various soils.

35,564.—J. R. Hyde (assignor to Charles Eddy & Co.), of Troy, N. Y., for Improvement in Stoves :

I claim the suspending of the said boiler, D, at the upper corners thereof next adjoining the stove, by means of the brackets, b b, in combination with the brackets, c c, projecting from the said boiler, D, into the recess, a, of brackets, b b ; so that, by the weight of the water in the said boiler, it will be brought into close conjunction to and with the stove, thus connected with said boiler, substantially as described and set forth.

35,565.—Luke Kavanaugh (assignor to himself, and Gage, Campbell & Gage), of Waterford, N. Y., for Improvement in Burrs for Knitting :

I claim a rotary knitting burr, having removable wings, A, held stationary within oblique radial slots, b, in a hub, c, by means of detachable rings or disks, D D, engaged with and clamped against the ends of the wings, substantially as set forth.

35,566.—James McNamee (assignor to himself and H. F. Steckel), of Easton, Pa., for Improvement in Registers for Bar Rooms :

I claim the box, A, provided with the numbered compartments, B, having a tilting or movable bottom, D′, in connection with the drawer, E, also placed in the box, A, and arranged with the compartments, B, substantially as and for the purpose specified.

I further claim the passages, D, numbered as shown at the the front of the box, A, and provided with the inclined bottoms, b, when said passages are used in connection with the numbered compartments, B, tilting or moving bottom, D′, and drawer, E, for the purpose set forth.

35,567.—Stuart Perry, of Newport, N. Y., assignor to C. H. A. Carter, of New York City, for Improvement in Horse Powers :

I claim, first, supporting the end of the shaft, B, in or near the center of the main drive wheel, E, for the purpose substantially as described.

I also claim, in combination with a main drive shaft that has upon its outer end a wheel that may run over an uneven track, the hanging of the opposite end in a rocking or pivoted box, to yield thereto, substantially as described.

I also claim, in combination with a main drive wheel, E, and the bevel pinion, g, the compound pinion, F, composed partially of square and partially of beveled teeth, substantially as and for the purpose set forth.

35,568.—George Potts (assignor to himself, Joseph and William and A. and J. R. Potts), of Yocumtown, Pa., for Improved Washing Machine :

I claim, the combination and arrangement of the vat, A, links, G G, rock shaft, I, and levers, E E, firmly or rigidly fastened to the rubber, D, substantially as described, for the purposes set forth.

35,569.—J. M. Sanborn, of Hardwick, Vt., assignor to himself and E. M. Gifford, of Wolcott, Vt., for Improved Portable Milk Cooler :

I claim the new article of manufacture described, adapted to the filtering of milk or other liquid through water so as to change its temperature, and to be readily applied to and removed from an ordinary vessel, substantially as and for the purpose set forth.

35,570.—Rufus Sibley (assignor to Samuel Mowry), of Greenville, Conn., for Press for Photographs :

I claim, in combination with the bed and rails, the traveling truck or carriage, and the polishing roll, operating in connection therewith, substantially in the manner and for the purpose described.

35,571.—J. E. Smith (assignor to himself and C. T. and J. N. Chester), of New York City, for Improvement in Electro-Magnetic Telegraphs :

I claim, the combination of electro-magnets in a main telegraph circuit substantially as described, whereby the vibrating armature lever of the first or receiving magnet is made to discharge or neutralize the escape or abnormal currents flowing through the second or working magnets when the main circuit is opened in the operation of telegraphing, substantially as set forth.

35,572.—R. M. Treat (assignor to himself and G. H. Daley), of Morris, Conn., for Improvement in Horse Rakes :

I claim, first, The rigid bars, d d, or their equivalent, extending out from the back of the turning axle, A a b, beyond the rear of the circumference of the wheels, for supporting a long raker with short teeth, in the manner and for the purpose as described.

Second, The swinging, adjustable clearer or discharger, G, arranged and operating substantially in the manner and for the purpose described.

Third, The raker, F, in combination with the curved eccentric rods, g g, and discharger or clearer, G, constructed and operating substantially in the manner and for the purpose described.

Fourth, The arrangement of the wheels, C C, axle, A a b, shafts, B B, seat D, bars, d d, and raker, F, with hand lever, H, in the manner and for the purpose described.

35,573.—W. H. Willard (assignor to Sarah E. Willard), of Cleveland, Ohio, for Improved Apparatus for Adjusting Propellers relatively to the Draft of Water.

I claim, the combination of the oscillating bed plate, A, rotating packer, B, and guard or fender, V, constructed substantially as described, and for the purposes set forth.

35,574.—Smith Groom, of Troy, N. Y., for Improvement in Stoves :

I claim the introduction of highly-heated steam into the fire chamber, by means of annular chambers or pipes surrounding the said fire chamber on the inside thereof, and having therein apertures through which such steam or hydrogen is admitted into the fire around the outside thereof, whereby combustion is greatly aided and the fuel economized, substantially as described and set forth.

35,575.—James McCholland, of Reading, Pa., for Improvement in Giffard's Injector :

I claim the chamber, A, with the branch, c, communicating with the boiler and branch, b, for the water, in combination with the nozzle, B, for the steam ; the whole being formed and arranged substantially as and for the purpose set forth.

DESIGN.

1,604.—G. L. Kelty, of New York City, Design for Tassel Tops.

TO OUR FRIENDS.

NOW IS THE TIME TO FORM CLUBS.

The present number closes another volume of this journal. We appeal to its friends in all sections of the country where mail facilities exist to endeavor to form clubs for the coming year. We feel justified in asserting that no other journal in this country furnishes the same amount of useful reading, and especially at the extraordinarily-low price at which it is furnished. Ten persons can club together and get the paper at $1 50 each for one year. Twenty persons clubbing together can have it at the rate of only $1 40. Think of getting a volume of 832 pages of useful reading matter, profusely illustrated with between 500 and 600 orginal engravings, for such a small sum of money. Single Subscriptions, one year, $2; six months, $1. Even though the times may be hard, we must keep reading and thinking, and thus be prepared to overcome temporary difficulties and open new channels of wealth and prosperity.—Friends, send in your clubs ; at least renew your own subscriptions promptly.

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Notes and Queries

J. B. C., of Ohio.—On page 169, Vol. VI. Scientific American, you will find an instructive article on the subject of India-rubber rollers for washing machines. If you have any improvements upon which you wish to obtain patents, you will have no difficulty in obtaining the rollers from the Metropolitan Washing Machine Company, No. 2½ Dey street. You have a right to alter the mechanical construction of your machine, so long as you do not change the claim.

W., of Lowell.—We do not think your improvement in torpedoes patentable. A similar water-proof joint has been applied to other uses, and its application to a torpedo would be a mere double use.

Maple Sirup.—A. D. Smith, of Danby, Vt., is the manufacturer of a most excellent quality of maple sirup. We speak from experience.

S. F., of Pa.—The 15-inch smooth-bore guns to which you refer are for the navy; the 12-inch rifled guns are for forts, one 12-inch rifled gun has been made already at the Fort Pitt works.

A. L., of Mass.—The chloride of lime is bleaching powder, and consists of dry lime in powder saturated with chlorine gas. It will not do to use it for whitewashing the walls of rooms. The lime whitewash, to which you refer, is made with common lime slacked in the usual way, to which is added about one pound of common salt to the ten gallons.

C. R. B., of Kansas.—You will find that it takes but little, if any, more fuel to keep your boiler 15 lbs. above the working pressure in your cylinder. Fuel is always wasted when the steam is allowed to run down. Much fuel may be saved by careful firing.

J. A., of Ill.—India rubber is not soluble in alcohol, but neither it nor gutta percha makes good vessels for containing alcoholic spirits. A small quantity of essential oil in these gums imparts a disagreeable taste and odor to spirits.

R. S. L., of Ohio.—The quantity of water, in pounds, falling in one minute, multiplied into the perpendicular hight of your fall, and divided by 33,000, will give you its horse power, from which it is common to deduct one-third for friction leakage, &c. The water acts upon an overshot wheel by its gravity. If you multiply the area of your open pipe by the square root of its depth in feet, and by 200, it will give the cubic feet of water discharged per minute.

J. H. F., of Kansas.—If you wish to keep steam up in your boiler at a working pressure all night, to start your engine in the morning without kindling a fire, of course you must expect your boiler to wear out somewhat faster than otherwise. We prefer to use a damper in the smoke pipe so as to keep a low fire always under the boiler at night.

J. R. B., of N. J.—Dry loam or charcoal dust is superior to lime for spreading on the floor of a hen house. Old india-rubber shoes may be patched by the use of warm india-rubber cement, and patches of old rubber laid on and pressed down with a flat iron.

Special Notice—Foreign Patent.—The population of Great Britain, is 30,000,000; of France, 35,000,000; Belgium, 5,000,000, Austria, 40,000,000; Prussia, 20,000,000; and Russia, 60,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. Nearly all of the patents secured in foreign countries by Americans are obtained through our agency. Address Munn & Co., 37 Park row, New York. Circulars about foreign patents furnished free.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, June 18, 1862:—

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